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The math department at LDHSS is committed to student success in mathematics, and our Mastery program is a key component of this success. The program has had a *significant positive impact* on student performance at Sir Robert Borden since 1996.

Please review the [policy](#) and how you will be [evaluated](#). Their are [sample question](#) for each topic and each test. During term one you will complete the first five tests, and the following five will appear in term two. Their will be a mastery test at the end of the semester 100 questions that will represent 5% of your final mark.

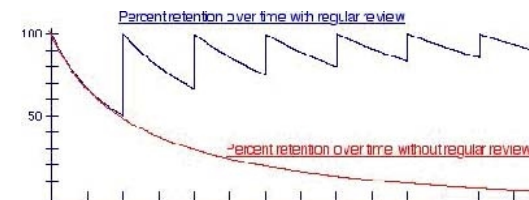
a. Policy

The math department at LDHSS is committed to student success in mathematics, and our Mastery program is a key component of this success. The program has had a *significant positive impact* on student performance at Sir Robert Borden over the past 9 years. This document explains the rationale behind the program, and its implementation at LDHSS.¹

Rationale:

Sets of basic skills and concepts have been identified in each of our math courses which students are expected to *master*. Mastering these skills and concepts means demonstrating knowledge and understanding at a consistently high level. This mastery is a *prerequisite for the more sophisticated problem solving* that permeates the curriculum.

The Mastery material has been designed to *maximize student success*. Studies have shown that when students review a concept every two or three weeks for an extended period of time, *long-term retention is dramatically improved*, so our objective is to have students review mastery skills and concepts regularly throughout the course. Students will write mastery tests regularly on skills covered up to that point in their math curriculum. Furthermore, mastery provides a link between courses. In every course, mastery includes skills and concepts developed in previous courses, so there is little opportunity to forget key ideas



¹ The mastery program was conceived and developed by Rob McLeish who was the Math department head at Sir Robert Borden HS from 1996 to 2008. Student, teacher, and parent feedback was used to refine the program over the years to maximize it's effectiveness. Mr. McLeish continues to support and develop this exceptional program in conjunction with teachers, and is now offering mastery support to other interested schools in the board.

Students can no longer claim that they “can’t get it”; the questions are at a level that every student can master. *No question is a surprise*; students have access to *every* question and its answer. Access to practice tests and descriptive solutions is available on-line. Furthermore, *students get many chances* throughout the semester to improve their performance through a series of carefully planned cumulative tests. Only the most recent, most consistent marks “count” in the end. Effort leads to success in mastery, which in turn *improves student confidence* and student performance in all other forms of evaluation. As students progress through our program from grade 9 to grade 12, they learn to appreciate the way that mastery contributes to their success.

Implementation:

Every student receives a *sample booklet* (online) at the beginning of the semester which contains a set of sample mastery questions for every topic in the course. Different versions of each of the sample questions make up the *test bank*. These questions are virtually identical to the sample questions! The test bank and answers will be made available to students in the classroom. Although the sample questions should be enough, **students may purchase the actual test bank to practice with.**

Students are encouraged to *practice mastery at home* using materials found on the *school website*: <https://sites.google.com/a/ldhss.ocdsb.ca/mastery>. Students can do sample questions by topic or practice tests. They can have them marked by the computer and read complete explanations for each question on line.

b. Evaluation

Evaluation:

Mastery is worth 10% of the final mark in all courses, and falls into the category of Knowledge and Understanding. Many students find that a focus on mastery can have a big impact on their final marks in math courses. Typically over half of the class will achieve 100% on Mastery by the end of the year! An indirect benefit is achieved by building a firm foundation of basic concepts and skills on which to build more advanced problem solving skills.

- Students write 10 mastery tests per semester, typically with 30 multiple choice questions per test. Each test adds some new material as well as reviewing previous course material
- The raw score from each mastery test is converted to a level. The levels and associated percentage equivalents correspond to the levels of achievement. For example, in an academic class, a raw score of 26 out of 30 converts to a level 3 performance (75%).
- On the report card, a grade is calculated using the median of the most recent 5 mastery tests.
- If the last three mastery tests in a term are in the level 4 range (4- and up), the mastery mark is 100% for that report.
- Students are offered an opportunity to “makeup” a mastery test twice per semester. The makeup mark can replace any other mastery test mark.

Academic Marking Scale for Mastery Tests

Mark out of 30	Level	% equivalent
30	4++	100
29	4+	95
28	4	89
27	4-	84
26	3	75
25	2+	68
24	2	65
23	1+	58
22	1	55
19-21	0+	45
17-18	0	35
11-16	0-	25
0-10	0--	0

c. FAQ

If I get 80% of the questions right, why isn't my mastery mark 80%?

Among the many reasons for this are the following:

- We expect all students in the course to get virtually perfect on mastery tests every time. If they do not, it is an important indicator that they are not prepared for 'normal' tests and exams. We want to motivate students to make sure they have **no** gaps in understanding as we progress through a course. Knowing only 80% of mastery questions means that 20% of the absolute basics are missing - and this is not acceptable. On a 30 question test, students who get more than 3 questions wrong need to work harder to ensure success.

- the questions are all 'multiple choice' and significantly easier than normal test/exam questions where students have to select and sequence a number of different skills and concepts. In addition, *all* questions and answers are readily available to students. Without a conversion scale, overall marks would be dramatically inflated relative to other assessment tools - marks that would not accurately reflect a student's performance or readiness for subsequent math courses. Despite the 'harshness' of the conversion scale, student marks for mastery are usually higher than normal test marks by the end of a course!

What happens if a student is absent for a mastery test?

An optional 'extra' mastery test is given at the end of each term - usually after school and is used to replace one mastery test - either the one missed or the one that would improve the mark. Writing the extra mastery test can never lower the overall mastery mark!

Can you explain how the mastery mark is determined?

It is the median of the last 5 mastery test marks or 100% if the last 3 test marks are in the level 4 range. The following shows a number of different scenarios and the mastery mark for the term.

Mastery test scores	Extra mastery test	Scores after extra	Sorted scores	Median	Mastery Mark	Rationale
3,0 ⁺ ,A,1,4	2	3,0 ⁺ ,A,2,4	A,0 ⁺ ,2,3,4	2	65%	Although the student missed a test, we can replace it OR the 0 ⁺ or the level 1 mark with the 2, because it becomes the median.
0,1,4 ⁻ ,A,4 ⁻	4	0,1,4 ⁻ ,4,4 ⁻	0,1,4 ⁻ ,4 ⁻ ,4	4 ⁻	100%	The extra test replaced a missed test because the last three are now in the level 4 range.
4 ⁻ ,1,0,A,4 ⁻	4	4 ⁻ ,4,0,A,4 ⁻	A,0,4 ⁻ ,4 ⁻ ,4	4 ⁻	84%	In this case, the last three are not level 4 scores, so the A, 0, or 1 can be replaced with the same effect - the median is 4 ⁻ .
2 ⁻ ,1,2,3,2	0	2 ⁻ ,0,2,3,2	0,2 ⁻ ,2,2,3	2	65%	Although the extra score is worse than all other scores it does not lower the mastery mark if used to replace one of the lower two marks.
4 ⁺⁺ ,4 ⁺⁺ ,A,A,A	4 ⁺⁺	4 ⁺⁺ ,4 ⁺⁺ ,A,A,4 ⁺⁺	A,A,4 ⁺⁺ ,4 ⁺⁺ ,4 ⁺⁺	4 ⁺⁺	100%	This student was absent for the last three tests of the term, but wrote the extra test. Replacing just one of those absent tests with a 4 ⁺⁺ still resulted in a median of 100%!

Mastery Table for MPM 2D

The following table shows the guideline used to create each of the mastery tests throughout the course. There could be very minor variations in this distribution.

Unit	Topic	Number of available questions	Test 1	Test 2	Term 1	Test 3	Test 4	Test 5	Test 6	Test 7	Term 2	Test 8	Test 9	Test 10
1	Real Numbers	67	7	5	3	3	1	1	1	1	1	1	1	1
2	Algebra Review	49	7	6	5	4	2	1	1	1	1	2	2	
3	Linear Relations	45	7	5	4	2	1	1	1	1	1	1	1	
4	Systems of Equations	35	7	6	5	4	2	2	1	1	2	2		
5	TI-83 Linear Relations	8	2	2	2	1	0	0	0	0	0	0	1	
6	Analytic Geometry	24	0	6	5	4	2	2	2	1	1	1		
7	Non-Linear Relations & Exponents	18	0	0	6	4	3	2	1	1	1	1		
8	Quadratics & Systems on TI-83	16	0	0	0	4	4	3	2	1	2	1		
9	Quadratic Relations Part I	16	0	0	0	4	4	4	2	1	1	2		
10	Factoring and Quadratic Equations	51	0	0	0	0	11	10	6	6	5	5		
11	Transformations and Quadratics	21	0	0	0	0	0	4	2	2	2	2		
12	Quadratic Relations Part II	49	0	0	0	0	0	0	11	7	5	4		
13	Proportional Thinking and Trigonometry	42	0	0	0	0	0	0	0	7	7	7		
	Totals	423	30	30	30	30	30	30	30	30	30	30	30	

2D 01 Real Numbers

MULTIPLE CHOICE

1. Evaluate $\frac{-2+8}{-2-1}$

- a. 10 b. -2 c. 3 d. -3.3

ANS: B

$$\frac{-2+8}{-2-1}$$

The division bar acts like brackets, so you must do the addition in the numerator and the subtraction in the denominator before the division.

$$= \frac{6}{-3}$$

A positive divided by a negative is negative, so the answer is -2.

$$= -2$$

PTS: 1

2. Evaluate $\frac{-2-3}{-2+1}$

- a. -1 b. -2 c. 5 d. -5

ANS: C

$$\frac{-2-3}{-2+1}$$

The division bar acts like brackets, so you must do the subtraction in the numerator and the addition in the denominator before the division.

$$= \frac{-5}{-1}$$

A negative divided by a negative is positive, so the answer is +5.

$$= 5$$

PTS: 1

3. Evaluate $\frac{-2+10}{-3-1}$

- a. 5 b. -5 c. -1 d. -2

ANS: D

$$\frac{-2+10}{-3-1}$$

The division bar acts like brackets, so you must do the addition in the numerator and the subtraction in the denominator before the division.

$$= \frac{8}{-4}$$

A positive divided by a negative is negative, so the answer is -2.

$$= -2$$

PTS: 1

4. Evaluate $\frac{-5-3}{-1+3}$

- a. -4 b. 2 c. -1 d. 0.5

ANS: A

$$\begin{array}{r} -5-3 \\ -1+3 \\ \hline -8 \\ 2 \\ -4 \end{array}$$

The division bar acts like brackets, so you must do the subtraction in the numerator and the addition in the denominator before the division.

A negative divided by a positive is negative, so the answer is -4.

PTS: 1

5. Evaluate $\frac{-5-3}{-1-3}$

- a. -4 b. 2 c. -1 d. 0.5

ANS: B

$$\begin{array}{r} -5-3 \\ -1-3 \\ \hline -8 \\ -4 \\ 2 \end{array}$$

The division bar acts like brackets, so you must do the subtraction in the numerator and denominator before the division.

A negative divided by a negative is positive, so the answer is +2.

PTS: 1

6. Evaluate $-4 - 2(-3)$

- a. -10 b. 18 c. 2 d. 6

ANS: C

$$\begin{array}{l} -4 - 2(-3) \\ = -4 - (-6) \\ = -4 + 6 \\ = 2 \end{array} \quad \text{or} \quad \begin{array}{l} -4 - 2(-3) \\ = -4 + (-2)(-3) \\ = -4 + 6 \\ = 2 \end{array}$$

We can read this as -4 subtract 2 multiplied by -3. The multiplication of 2 by -3 must be performed first. Subtracting negative 6 is the same as adding positive 6. The second method is to think of "subtract 2(-3)" as "add (-2)(-3)".

PTS: 1

7. Evaluate $-3(-1-3)$

- a. -12 b. 6 c. -6 d. 12

ANS: D

$$\begin{array}{r} -3(-1-3) \\ = -3(-4) \\ = 12 \end{array}$$

-1 subtract 3 is -4.

A negative multiplied by a negative is positive.

PTS: 1

8. Evaluate $(-1-3)-3$

- a. 12 b. -7 c. -5 d. 6

ANS: B

$$\begin{array}{r} (-1-3)-3 \\ = (-4)-3 \\ = -4-3 \\ = -7 \end{array}$$

-1 subtract 3 is -4.

Because "-" separates the number from the bracket, it is subtraction.

PTS: 1

9. Evaluate $-1 - 3(-3)$

- a. 8 b. -10 c. 12 d. 6

ANS: A

$$\begin{array}{l} -1 - 3(-3) \\ = -1 - (-9) \\ = -1 + 9 \\ = 8 \end{array} \quad \text{or} \quad \begin{array}{l} -1 - 3(-3) \\ = -1 + (-3)(-3) \\ = -1 + 9 \\ = 8 \end{array}$$

The question reads "-1 subtract 3 multiplied by -3", so the multiplication of 3 by -3 must be performed first. $3(-3) = -9$. Subtracting negative 9 is the same as adding positive 9. The second method is to think of "subtract $3(-3)$ " as "add $(-3)(-3)$ ".

PTS: 1

10. Evaluate $-(-2+3)4$

- a. 14 b. 20 c. -4 d. -20

ANS: C

$$\begin{array}{r} -(-2+3)4 \\ = -(1)4 \\ = -4 \end{array}$$

Complete the addition inside the brackets first. The question now reads "negative 1 multiplied by 4", giving -4.

PTS: 1

11. Which of the following are equal to 9?

- i) $(-3)^2$ ii) (-3^2) iii) -3^2
a. i only b. ii only c. iii only d. i and iii e. ii and iii

ANS: A

$$\begin{array}{r} (-3)^2 \\ = (-3)(-3) \\ = 9 \\ (-3^2) \\ = (-3)(3) \\ = -9 \end{array}$$

In this case the negative is 'attached' to the 3 before it is squared, so this expression means $(-3)(-3)$ which is equal to 9.

In this case the brackets do nothing, so this expression is the same as -3^2 , so both ii and iii mean the same thing. In this expression, order of operations tells us to square the number before attaching the negative sign. Only i is 9.

PTS: 1

12. Which of the following are equal to 9?

- i) $-(-3)^2$ ii) $-(-3^2)$ iii) -3^2

- a. i only b. ii only c. iii only d. i and iii e. ii and iii

ANS: B

$$\begin{aligned} & -(-3)^2 \\ & = -(-3)(-3) \\ & = -9 \end{aligned}$$

In this case the negative is 'attached' to the 3 before it is squared, so $(-3)^2$ means $(-3)(-3)$ which is equal to 9. With the negative outside the bracket, the answer is -9.

$$\begin{aligned} & -(-3^2) \\ & = -(-3 \times 3) \\ & = -(-9) \\ & = 9 \end{aligned}$$

The expression inside the brackets is -3^2 (same as iii). Order of operations tells us to square the number before attaching the negative sign. The number inside the brackets works out to be -9, and with the negative outside the bracket, the answer is 9. Only ii is 9.

PTS: 1

13. Which of the following are equal to -9?

- i) $(-(-3))^2$ ii) $-(-3^2)$ iii) -3^2

- a. i only b. ii only c. iii only d. i and iii e. ii and iii

ANS: C

$$\begin{aligned} & (-(-3))^2 \\ & = (3)^2 \\ & = 9 \end{aligned}$$

Order of operations tells us to complete operations inside brackets first. If we look inside the outer brackets, the expression is $-(-3)$ which is just 3, so the original expressions is equivalent to $(3)^2$ which is just 9.

$$\begin{aligned} & -(-3^2) \\ & = -(-3 \times 3) \\ & = -(-9) \\ & = 9 \end{aligned}$$

The expression inside the brackets is -3^2 (same as iii). Order of operations tells us to square the number before attaching the negative sign. The number inside the brackets works out to be -9, and with the negative outside the bracket, the answer is 9. Only iii is -9.

PTS: 1

14. Which of the following are equal to -9?

- i) $-(-3)^2$ ii) $-(-3^2)$ iii) -3^2

- a. i only b. ii only c. iii only d. i and iii e. ii and iii

ANS: D

$$\begin{aligned} & -(-3)^2 \\ & = -(-3)(-3) \\ & = -9 \end{aligned}$$

In this case the negative is 'attached' to the 3 before it is squared, so $(-3)^2$ means $(-3)(-3)$ which is equal to 9. With the negative outside the bracket, the answer is -9.

$$\begin{aligned} & -(-3^2) \\ & = -(-3 \times 3) \\ & = -(-9) \\ & = 9 \end{aligned}$$

The expression inside the brackets is -3^2 (same as iii). Order of operations tells us to square the number before attaching the negative sign. The number inside the brackets works out to be -9, and with the negative outside the bracket, the answer is 9. i and iii are both -9.

PTS: 1

15. Which of the following are equal to -9?

- i) $(-3)^2$ ii) (-3^2) iii) -3^2

- a. i only b. ii only c. iii only d. i and iii e. ii and iii

ANS: E

$$\begin{aligned} & (-3)^2 \\ & = (-3)(-3) \\ & = 9 \end{aligned}$$

In this case the negative is 'attached' to the 3 before it is squared, so this expression means $(-3)(-3)$ which is equal to 9.

$$\begin{aligned} & (-3^2) \\ & = (-3)(-3) \\ & = -9 \end{aligned}$$

In this case the brackets do nothing, so this expression is the same as -3^2 , so both ii and iii mean the same thing. In this expression, order of operations tells us to square the number before attaching the negative sign. Both ii and iii are -9.

PTS: 1

16. If $x = -4$, then evaluate $x - x^2$

- a. -20 b. 12 c. 4 d. -12

ANS: A

if $x = -4$ then

$$\begin{aligned} & x - x^2 \\ & = (-4) - (-4)^2 \\ & = -4 - (16) \\ & = -4 - 16 \\ & = -20 \end{aligned}$$

First, replace x with -4 in brackets. The brackets group the negative sign with the 4. Next, we must square -4 to get 16. Finally subtract to get -20.

PTS: 1

17. If $x = -3$, then evaluate $2x^2 - x$

- a. -15 b. 21 c. 15 d. 39

ANS: B

if $x = -3$ then

$$\begin{aligned} & 2x^2 - x \\ & = 2(-3)^2 - (-3) \\ & = 2(9) + 3 \\ & = 18 + 3 \\ & = 21 \end{aligned}$$

First, replace x with -3 in brackets. The brackets group the negative sign with the 3. Next, we must square -3 to get 9 and change subtract -3 to add +3. Multiply next and then add to get 21

PTS: 1

18. If $x = -3$, then evaluate $2x - x^2$
 a. 15 b. 3

c. -15 d. -12

ANS: C

if $x = -3$ then

$$\begin{aligned} 2x - x^2 &= 2(-3) - (-3)^2 \\ &= 2(-3) - (9) \\ &= -6 - 9 \\ &= -15 \end{aligned}$$

First, replace x with -3 in brackets. The brackets group the negative sign with the 3. Next, we must square -3 to get 9. Multiply 2 by -3 next and then subtract 9 to get -15 .

PTS: 1

19. If $x = -3$, then evaluate $x - 2x^2$
 a. 15 b. -45

c. -15 d. -21

ANS: D

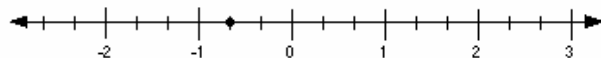
if $x = -3$ then

$$\begin{aligned} x - 2x^2 &= (-3) - 2(-3)^2 \\ &= (-3) - 2(9) \\ &= -3 - 18 \\ &= -21 \end{aligned}$$

First, replace x with -3 in brackets. The brackets group the negative sign with the 3. Next, we must square -3 to get 9. Multiply 2 by 9 next and then subtract from -3 to get -21 .

PTS: 1

20. The number marked on the number line is



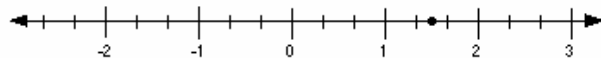
- a. -0.5 b. $-\frac{2}{3}$ c. $\frac{2}{3}$ d. $-\frac{3}{4}$

ANS: B

There are 3 marks on the number line between each unit, so each one is $\frac{1}{3}$. The number marked is 2 spaces left of 0, so it is $-\frac{2}{3}$.

PTS: 1

21. The number marked on the number line is



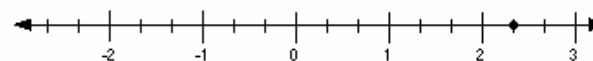
- a. $\frac{2}{3}$ b. $\frac{1}{2}$ c. 1.5 d. $\frac{4}{3}$

ANS: C

The mark is half way between 1 and 2, so it must be 1.5

PTS: 1

22. The number marked on the number line is



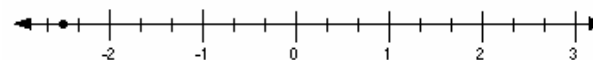
- a. $\frac{9}{4}$ b. 2.1 c. $\frac{2}{3}$ d. $\frac{7}{3}$

ANS: D

There are 3 marks on the number line between each unit, so each one is $\frac{1}{3}$. The number marked is 1 space to the right of 2, so it is $2\frac{1}{3}$ or $\frac{7}{3}$. It is 7 spaces to the right of 0.

PTS: 1

23. The number marked on the number line is



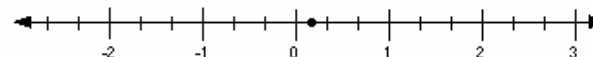
- a. -2.5 b. -1.5 c. $-\frac{7}{3}$ d. $-\frac{9}{4}$

ANS: A

If -3 was marked on the number line we could see that the number marked is halfway between -2 and -3 , so it is -2.5 . If we look elsewhere on the number line we can see that $1\frac{1}{2}$ spaces is 0.5 units. The marked number is $1\frac{1}{2}$ spaces to the left of -2 , so it is -2.5 .

PTS: 1

24. The number marked on the number line is



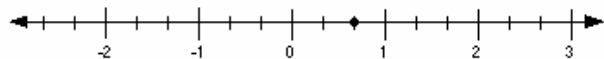
- a. 0.5 b. $\frac{1}{6}$ c. $\frac{1}{3}$ d. $\frac{1}{4}$

ANS: B

There are 3 marks on the number line between each unit, so each one is $\frac{1}{3}$. The number marked is $\frac{1}{2}$ of one space to the right of 0, so it is $\frac{1}{6}$. If every one of the spaces was split in half, there would be 6 of them in each unit, so each one would be $\frac{1}{6}$.

PTS: 1

25. The number marked on the number line is



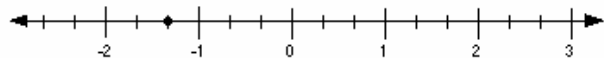
- a. $\frac{1}{3}$ b. 0.5 c. $\frac{2}{3}$ d. 0.3

ANS: C

There are 3 marks on the number line between each unit, so each one is $\frac{1}{3}$. The number marked is 2 of these spaces to the right of 0, so it is $\frac{2}{3}$.

PTS: 1

26. The number marked on the number line is



- a. $-\frac{3}{4}$ b. $-\frac{2}{3}$ c. -1.5 d. $-\frac{4}{3}$

ANS: D

There are 3 marks on the number line between each unit, so each one is $\frac{1}{3}$. The number marked is 1 of these spaces to the left of -1, so it is $-1\frac{1}{3}$ or $-\frac{4}{3}$. Or ... we count 4 of the smaller spaces to the left of 0, giving $-\frac{4}{3}$.

PTS: 1

27. $\left(\frac{3}{5}\right)\left(\frac{1}{2}\right)$

- a. $\frac{3}{10}$ b. $\frac{4}{7}$ c. $\frac{1}{3}$ d. $\frac{6}{5}$

ANS: A

To multiply fractions, just multiply the numerators and denominators to get $\frac{3}{10}$.

PTS: 1

28. $\left(\frac{3}{7}\right)\left(\frac{1}{2}\right)$

- a. $\frac{4}{9}$ b. $\frac{3}{14}$ c. $\frac{1}{3}$ d. $\frac{6}{7}$

ANS: B

To multiply fractions, just multiply the numerators and denominators to get $\frac{3}{14}$.

PTS: 1

29. $\left(\frac{1}{3}\right)\left(\frac{2}{3}\right)$

- a. $\frac{1}{3}$ b. $\frac{1}{2}$ c. $\frac{2}{9}$ d. $\frac{3}{5}$

ANS: C

To multiply fractions, just multiply the numerators and denominators to get $\frac{2}{9}$.

PTS: 1

30. $\left(\frac{3}{4}\right)\left(\frac{1}{2}\right)$

- a. $\frac{3}{2}$ b. $\frac{2}{3}$ c. $\frac{1}{2}$ d. $\frac{3}{8}$

ANS: D

To multiply fractions, just multiply the numerators and denominators to get $\frac{3}{8}$.

PTS: 1

31. $\frac{1}{4} \div \frac{2}{5}$

- a. $\frac{5}{8}$ b. $\frac{1}{10}$ c. $\frac{2}{5}$ d. $\frac{1}{20}$

ANS: A

To divide by a fraction, multiply by its reciprocal, so $\frac{1}{4} \div \frac{2}{5} = \frac{1}{4} \times \frac{5}{2} = \frac{5}{8}$

PTS: 1

32. $\frac{1}{5} \div \frac{2}{3}$
 a. $\frac{2}{15}$ b. $\frac{3}{10}$ c. $\frac{1}{4}$ d. $\frac{1}{50}$

ANS: B

To divide by a fraction, multiply by its reciprocal, so $\frac{1}{5} \div \frac{2}{3}$
 $= \frac{1}{5} \times \frac{3}{2}$
 $= \frac{3}{10}$

PTS: 1

33. $\frac{2}{3} \div \frac{1}{5}$
 a. $\frac{3}{10}$ b. $\frac{2}{15}$ c. $\frac{10}{3}$ d. $\frac{1}{15}$

ANS: C

To divide by a fraction, multiply by its reciprocal, so $\frac{2}{3} \div \frac{1}{5}$
 $= \frac{2}{3} \times \frac{5}{1}$
 $= \frac{10}{3}$

PTS: 1

34. $\frac{2}{5} \div \frac{1}{4}$
 a. $\frac{3}{20}$ b. $\frac{1}{10}$ c. $\frac{2}{5}$ d. $\frac{8}{5}$

ANS: D

To divide by a fraction, multiply by its reciprocal, so $\frac{2}{5} \div \frac{1}{4}$
 $= \frac{2}{5} \times \frac{4}{1}$
 $= \frac{8}{5}$

PTS: 1

35. $\frac{2}{3} + \frac{-1}{2}$
 a. $\frac{1}{6}$ b. $\frac{1}{5}$ c. $-\frac{1}{3}$ d. $-\frac{4}{3}$

ANS: A

$\frac{2}{3} + \frac{-1}{2}$
 $= \frac{4}{6} + \frac{-3}{6}$
 $= \frac{1}{6}$

To add fractions, get a common denominator (6) by multiplying the numerator and denominator of the first fraction by 2 and then the numerator and denominator of the second fraction by 3.

Now that we have a common denominator, add the numerators and keep the same base.

PTS: 1

36. $\frac{1}{4} + \frac{-2}{3}$
 a. $-\frac{1}{7}$ b. $-\frac{5}{12}$ c. $-\frac{1}{6}$ d. $-\frac{11}{12}$

ANS: B

$\frac{1}{4} + \frac{-2}{3}$
 $= \frac{3}{12} + \frac{-8}{12}$
 $= \frac{-5}{12}$

To add fractions, get a common denominator (12) by multiplying the numerator and denominator of the first fraction by 3 and then the numerator and denominator of the second fraction by 4.

Now that we have a common denominator, add the numerators and keep the same base.

PTS: 1

37. $\frac{-3}{4} + \frac{2}{3}$
 a. $-\frac{1}{2}$ b. $-\frac{1}{7}$ c. $-\frac{1}{12}$ d. $-\frac{17}{12}$

ANS: C

$\frac{-3}{4} + \frac{2}{3}$
 $= \frac{-9}{12} + \frac{8}{12}$
 $= \frac{-1}{12}$

To add fractions, get a common denominator (12) by multiplying the numerator and denominator of the first fraction by 3 and then the numerator and denominator of the second fraction by 4.

Now that we have a common denominator, add the numerators and keep the same base.

PTS: 1

38. $\frac{-2}{3} + \frac{1}{5}$

a. $-\frac{4}{5}$

b. $-\frac{1}{8}$

c. $-\frac{10}{3}$

d. $\frac{-7}{15}$

ANS: D

$$\begin{aligned} & \frac{-2}{3} + \frac{1}{5} \\ &= \frac{-10}{15} + \frac{3}{15} \\ &= \frac{-7}{15} \end{aligned}$$

To add fractions, get a common denominator (15) by multiplying the numerator and denominator of the first fraction by 5 and then the numerator and denominator of the second fraction by 3.

Now that we have a common denominator, add the numerators and keep the same base.

PTS: 1

39. $\frac{1}{4} - \frac{5}{6}$

a. $-\frac{7}{12}$

b. $\frac{13}{12}$

c. 2

d. $-\frac{3}{10}$

ANS: A

$$\begin{aligned} & \frac{1}{4} - \frac{5}{6} \\ &= \frac{3}{12} - \frac{10}{12} \\ &= \frac{-7}{12} \end{aligned}$$

To subtract fractions, get a common denominator (12) by multiplying the numerator and denominator of the first fraction by 3 and then the numerator and denominator of the second fraction by 2.

Now that we have a common denominator, subtract the numerators and keep the same base.

PTS: 1

40. $\frac{3}{4} - \frac{1}{3}$

a. $\frac{13}{12}$

b. $\frac{5}{12}$

c. 2

d. $\frac{1}{4}$

ANS: B

$$\begin{aligned} & \frac{3}{4} - \frac{1}{3} \\ &= \frac{9}{12} - \frac{4}{12} \\ &= \frac{5}{12} \end{aligned}$$

To subtract fractions, get a common denominator (12) by multiplying the numerator and denominator of the first fraction by 3 and then the numerator and denominator of the second fraction by 2.

Now that we have a common denominator, subtract the numerators and keep the same base.

PTS: 1

41. $\frac{5}{6} - \frac{1}{4}$

a. 2

b. $\frac{13}{12}$

c. $\frac{7}{12}$

d. $\frac{1}{4}$

ANS: C

$$\begin{aligned} & \frac{5}{6} - \frac{1}{4} \\ &= \frac{10}{12} - \frac{3}{12} \\ &= \frac{7}{12} \end{aligned}$$

To subtract fractions, get a common denominator (12) by multiplying the numerator and denominator of the first fraction by 2 and then the numerator and denominator of the second fraction by 3.

Now that we have a common denominator, subtract the numerators and keep the same base.

PTS: 1

42. $\frac{2}{5} - \frac{1}{10}$

a. $-\frac{1}{5}$

b. $\frac{23}{10}$

c. $\frac{7}{10}$

d. $\frac{3}{10}$

ANS: D

$$\begin{aligned} & \frac{2}{5} - \frac{1}{10} \\ &= \frac{4}{10} - \frac{1}{10} \\ &= \frac{3}{10} \end{aligned}$$

To subtract fractions, get a common denominator (10) by multiplying the numerator and denominator of the first fraction by 2 and then the numerator and denominator of the second fraction by 1.

Now that we have a common denominator, subtract the numerators and keep the same base.

PTS: 1

43. $\frac{-2}{5} - \frac{1}{10}$

a. -0.5

b. $-\frac{3}{10}$

c. $\frac{3}{10}$

d. $\frac{3}{5}$

ANS: A

$$\begin{aligned} & \frac{-2}{5} - \frac{1}{10} \\ &= \frac{-4}{10} - \frac{1}{10} \\ &= \frac{-5}{10} \\ &= -0.5 \end{aligned}$$

To subtract fractions, get a common denominator (10) by multiplying the numerator and denominator of the first fraction by 2 and then the numerator and denominator of the second fraction by 1.

Now that we have a common denominator, subtract the numerators and keep the same base.

PTS: 1

44. $\frac{-5}{6} - \frac{1}{4}$

- a. $\frac{-5}{4}$ b. $\frac{-13}{12}$ c. $\frac{-7}{12}$ d. -3

ANS: B

$$\begin{aligned} & \frac{-5}{6} - \frac{1}{4} \\ &= \frac{-10}{12} - \frac{3}{12} \\ &= \frac{-13}{12} \end{aligned}$$

PTS: 1

45. $\frac{-3}{4} - \frac{1}{3}$

- a. -4 b. $\frac{-5}{12}$ c. $\frac{-13}{12}$ d. $\frac{7}{12}$

ANS: C

$$\begin{aligned} & \frac{-3}{4} - \frac{1}{3} \\ &= \frac{-9}{12} - \frac{4}{12} \\ &= \frac{-13}{12} \end{aligned}$$

PTS: 1

46. $\frac{-1}{3} - \frac{5}{6}$

- a. $\frac{-13}{12}$ b. $-\frac{7}{18}$ c. $-\frac{5}{6}$ d. $-\frac{7}{6}$

ANS: D

$$\begin{aligned} & \frac{-1}{3} - \frac{5}{6} \\ &= \frac{-2}{6} - \frac{5}{6} \\ &= \frac{-7}{6} \end{aligned}$$

PTS: 1

To subtract fractions, get a common denominator (12) by multiplying the numerator and denominator of the first fraction by 3 and then the numerator and denominator of the second fraction by 2.

Now that we have a common denominator, subtract the numerators and keep the same base.

To subtract fractions, get a common denominator (12) by multiplying the numerator and denominator of the first fraction by 3 and then the numerator and denominator of the second fraction by 2.

Now that we have a common denominator, subtract the numerators and keep the same base.

To subtract fractions, get a common denominator (6) by multiplying the numerator and denominator of the first fraction by 2.

Now that we have a common denominator, subtract the numerators and keep the same base.

47. Express 0.5% as a decimal.

- a. 0.50 b. 50.0 c. 0.005 d. 0.05

ANS: C

0.5% means $\frac{0.5}{100}$ or $0.5 \div 100$. To divide 0.5 by 100, the decimal moves 2 spots to the left and the correct answer is 0.005.

PTS: 1

48. Express 23.1 as a percentage.

- a. 0.231% b. 2310% c. 231% d. 0.0231%

ANS: B

23.1 means $\frac{231}{10}$ or $\frac{2310}{100}$. Therefore, 23.1 is 2310%. Another way to do this is to use the fact that 100% is the same as the number 1. We know that if we multiply a number by 1 we don't change its value, so $23.1 = 23.1 \times 100\%$. Multiplying the 23.1 by the 100 we get 2310% (the decimal place moves 2 units to the right when you multiply by 100).

PTS: 1

49. Express $\frac{3}{5}$ as a percentage.

- a. 167% b. 1.67% c. 0.60% d. 60%

ANS: D

$\frac{3}{5}$ is the same as $\frac{3 \times 20}{5 \times 20}$ or $\frac{60}{100}$. Therefore, $\frac{3}{5}$ is 60%. Some students will do this question by remembering that $\frac{1}{5}$ is 20%, so $\frac{3}{5}$ is $3 \times 20\% = 60\%$. Another way to do this is to convert $\frac{3}{5}$ to a decimal by dividing 3 by 5 to get 0.6 and then convert the decimal to a percentage by multiplying it by 100%.

PTS: 1

50. Express $\frac{16}{10}$ as a percentage.

- a. 0.625% b. 62.5% c. 1.60% d. 160%

ANS: D

$\frac{16}{10}$ is the same as $\frac{16 \times 10}{10 \times 10}$ or $\frac{160}{100}$. Therefore, $\frac{16}{10}$ is 160%. Some students will do this question by remembering that $\frac{1}{10}$ is 10%, so $\frac{16}{10}$ is $16 \times 10\% = 160\%$. Another way to do this is to convert $\frac{16}{10}$ to a decimal by dividing 16 by 10 to get 1.6 and then convert the decimal to a percentage by multiplying it by 100%.

PTS: 1

51. Calculate 30% of 500.

- a. 15 b. 150 c. 15000 d. 1500

ANS: B

Remember that "of" can be translated as multiplication.

30% of 500

$$= 0.3 \times 500$$

$$= 150$$

Another way to do this is to note that 1% means 1 out of 100. So, 1% of 500 is 5. 30% of 500 is $30 \times 5 = 150$.

PTS: 1

52. 40% of _____ is 80.

- a. 200 b. 32 c. 50 d. 0.5

ANS: A

If 40% of the unknown number is 80, then 10% of the number would be 20 (divide both parts by 4). This means that 100% of the number is 200 (multiply both parts by 10), and 100% of the number IS the number! The number is 200.

This question is equivalent to 40 out of 100 is the same as 80 out of _____. Once you understand this meaning, it is easy to see that the answer is 200.

PTS: 1

53. 30% of _____ is 120.

- a. 25 b. 36 c. 40 d. 400

ANS: D

If 30% of the unknown number is 120, then 10% of the number would be 40 (divide both parts by 3). This means that 100% of the number is 400 (multiply both parts by 10), and 100% of the number IS the number! The number is 400.

This question is equivalent to 30 out of 100 is the same as 120 out of _____. 30 out of 100 is the same as 120 out of 400 (multiplying both by 4).

PTS: 1

54. 8 out of 25 is _____%

- a. 312.5% b. 3.125% c. 32% d. 200%

ANS: C

8 out of 25 is equivalent to 32 out of 100 (multiplying both by 4) or 32%. You could write 8 out of 25 as a fraction, $\frac{8}{25}$, and then either multiply the numerator and denominator by 4 OR express $\frac{8}{25}$ as a decimal and multiply by 100%.

This question is equivalent to 30 out of 100 is the same as 120 out of _____. 30 out of 100 is the same as 120 out of 400 (multiplying both by 4).

PTS: 1

55. 25 out of 20 is _____%

- a. 500% b. 80% c. 12.5% d. 125%

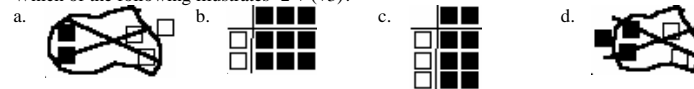
ANS: D

25 out of 20 is equivalent to 125 out of 100 (multiplying both by 5) or 125%. You could write 25 out of 20 as a fraction, $\frac{25}{20}$, and then either multiply the numerator and denominator by 5 OR express $\frac{25}{20}$ as a decimal and multiply by 100%.



This question is equivalent to 30 out of 100 is the same as 120 out of _____. 30 out of 100 is the same as 120 out of 400 (multiplying both by 4).

PTS: 1

56. Which of the following illustrates $-2 + (+3)$?



ANS: A

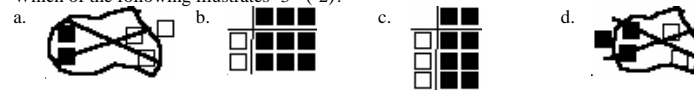
-2 is represented by  and +3 by . To add them we just put them together and 'marry'






two positives with two negatives by removing them from the picture.

PTS: 1

57. Which of the following illustrates $-3 - (-2)$?



ANS: D

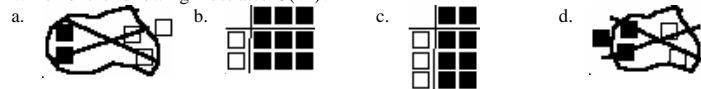
-3 is represented by  and -2 by . To subtract -2, we flip them over,  and add them. Now we just put them together and 'marry' two positives with two negatives by removing them



from the picture.

PTS: 1

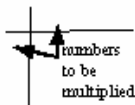
58. Which of the following illustrates $-3(+2)$?





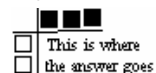
ANS: B

Because there is no sign between the 3 and the bracket, we know it must be multiplication, so we

use the multiplication chart:



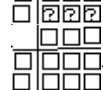
We are to multiply -3 by $+2$. It doesn't matter which number goes on top or along the side. This diagram uses -3  on the top, and $+2$  on the side giving us



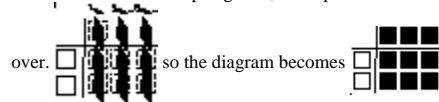
Now fill in the inside with tiles - don't worry about whether it is positive or negative yet



We know that if both numbers HAD been positive, the answer would be positive



To make the 3 on the top negative, we flip them all over, making everything underneath them flip

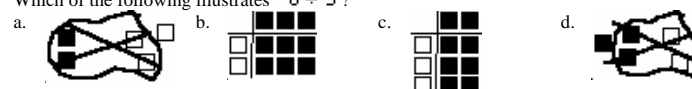


over.  so the diagram becomes . This shows us that $-3(+2)$ is equal to -

6.

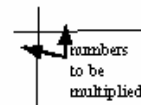
PTS: 1

59. Which of the following illustrates $-6 \div 3$?

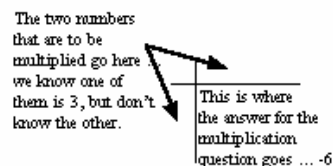


ANS: C

Division is the 'opposite' of multiplication, so we use the multiplication chart:



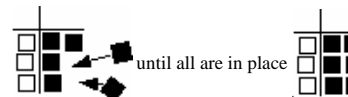
To find -6 divided by 3 is the same as asking " -6 is equal to 3 times what number?" The -6 is the answer to the multiplication question.



Start by filling in the $+3$ in the side (or top).




and then fill in the -6 beside the 3



Now we can see that we need 2 tiles on the top...



we're just unsure if positive or

negative. However, if the top row was positive, everything would be positive  and we

want the answer to be -6 . The top must be -2 to make the 'answer' tiles all flip over.



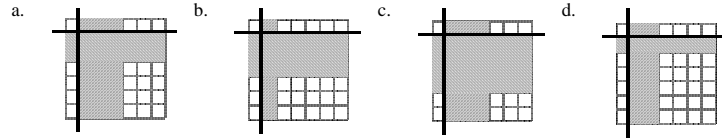


The correct diagram is . It shows us that $-6 \div 3$ is equal to -2.

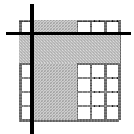
It also shows us that $-6 \div (-2) = 3$ $3(-2)=-6$ or even $-2(3)=-6$

PTS: 1

60. Which of the following diagrams illustrates that $\frac{1}{3} \times \frac{1}{2} = \frac{1}{6}$



ANS: A



The correct answer is .

It has 2 out of 6 or $\frac{1}{3}$ shaded on the left

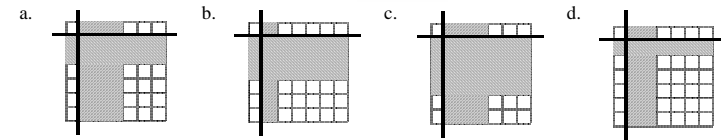
It also has 3 out of 6 or $\frac{1}{2}$ shaded on the top.

The overlapping area is 6 squares out of the 36 or $\frac{1}{6}$.

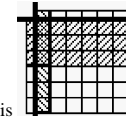
This diagram shows that $\frac{1}{3} \times \frac{1}{2} = \frac{1}{6}$.

PTS: 1

61. Which of the following diagrams illustrates that $\frac{1}{2} \times \frac{1}{6} = \frac{1}{12}$?



ANS: B



The correct answer is .

It has 3 out of 6 or $\frac{1}{2}$ shaded on the left

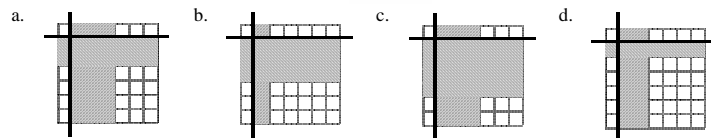
It also has 1 out of 6 or $\frac{1}{6}$ shaded on the top.

The overlapping area is 3 squares out of the 36 or $\frac{1}{12}$.

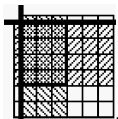
This diagram shows that $\frac{1}{2} \times \frac{1}{6} = \frac{1}{12}$.

PTS: 1

62. Which of the following diagrams illustrates that $\frac{2}{3} \times \frac{1}{2} = \frac{1}{3}$?



ANS: C



The correct answer is

It has 4 out of 6 or $\frac{2}{3}$ shaded on the left

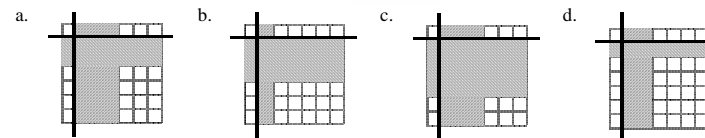
It also has 3 out of 6 or $\frac{1}{2}$ shaded on the top.

The overlapping area is 12 squares out of the 36 or $\frac{1}{3}$.

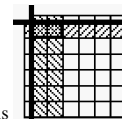
This diagram shows that $\frac{2}{3} \times \frac{1}{2} = \frac{1}{3}$.

PTS: 1

63. Which of the following diagrams illustrates that $\frac{1}{6} \times \frac{1}{3} = \frac{1}{18}$?



ANS: D



The correct answer is

It has 1 out of 6 or $\frac{1}{6}$ shaded on the left

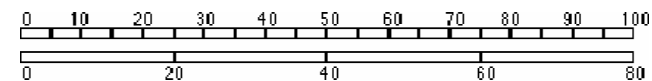
It also has 2 out of 6 or $\frac{1}{3}$ shaded on the top.

The overlapping area is 2 squares out of the 36 or $\frac{1}{18}$.

This diagram shows that $\frac{1}{6} \times \frac{1}{3} = \frac{1}{18}$.

PTS: 1

64. The diagram below can be used to show that ...



a. 25% of 80 is 20 b. 25% of 240 is 60 c. 40% of 40 is 16 d. 20% of 300 is 60

ANS: A

With the 100 (at the end of the top ruler) lined up with 80 on the one underneath, this setup can be used to find percentages of 80. In particular, if we find 25% on the top ruler and look below, we see that 25% of 80 is 20.

PTS: 1

2D 02 Algebra Review

MULTIPLE CHOICE

1. Simplify $-(3 - x)$ as far as possible.
 a. $-2x$ b. $x - 3$ c. $-3 - x$ d. $x + 3$

ANS: B PTS: 1

2. Simplify $-(x - 3)$ as far as possible.
 a. $2x$ b. $-x - 3$ c. $3 - x$ d. $-4x$

ANS: C PTS: 1

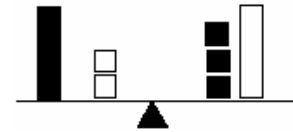
3. Simplify $-(3x - 2)$ as far as possible.
 a. $-x$ b. $-3x - 2$ c. $5x$ d. $-3x + 2$

ANS: D PTS: 1

4. Simplify $-(-3x + 2)$ as far as possible.
 a. x b. $3x - 2$ c. $5x$ d. $3x + 2$

ANS: B PTS: 1

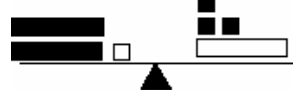
5. The following diagram illustrates an equation. Which of the following is a reasonable first step in order to solve the equation?



- a. add x to both sides b. add 2 to both sides c. subtract $2x$ from both sides d. divide both sides by 2

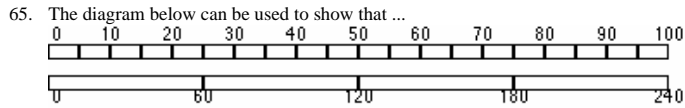
ANS: A PTS: 1

6. The following diagram illustrates an equation. Which of the following is a reasonable first step in order to solve the equation?



- a. add x to both sides b. subtract $2x$ from both sides c. add $2x$ to both sides d. divide both sides by -2

ANS: C PTS: 1

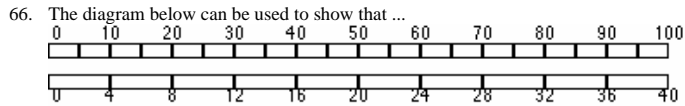


- a. 25% of 80 is 20 b. 25% of 240 is 60 c. 40% of 40 is 16 d. 20% of 300 is 60

ANS: B

With the 100 (at the end of the top ruler) lined up with 240 on the one underneath, this setup can be used to find percentages of 240. In particular, if we find 25% on the top ruler and look below, we see that 25% of 240 is 60.

PTS: 1

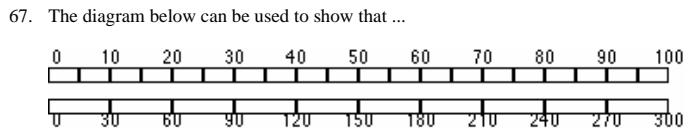


- a. 25% of 80 is 20 b. 25% of 240 is 60 c. 40% of 40 is 16 d. 20% of 300 is 60

ANS: C

With the 100 (at the end of the top ruler) lined up with 40 on the one underneath, this setup can be used to find percentages of 40. In particular, if we find 40% on the top ruler and look below, we see that 40% of 40 is 16.

PTS: 1



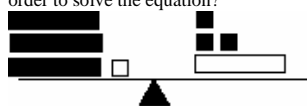
- a. 25% of 80 is 20 b. 25% of 240 is 60 c. 40% of 40 is 16 d. 20% of 300 is 60

ANS: D

With the 100 (at the end of the top ruler) lined up with 300 on the one underneath, this setup can be used to find percentages of 300. In particular, if we find 20% on the top ruler and look below, we see that 20% of 300 is 60.

PTS: 1

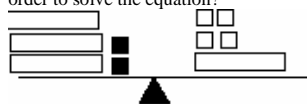
7. The following diagram illustrates an equation. Which of the following is a reasonable first step in order to solve the equation?



- a. subtract $3x$ from both sides b. add $3x$ to both sides c. add x to both sides d. divide both sides by -3

ANS: B PTS: 1

8. The following diagram illustrates an equation. Which of the following is a reasonable first step in order to solve the equation?



- a. add $3x$ to both sides b. add 4 to both sides c. add 2 to both sides d. divide both sides by 3

ANS: C PTS: 1

9. If $3x - 1 = 11$, then $x =$

- a. 4 b. $\frac{10}{3}$ c. 9 d. 7

ANS: A PTS: 1

10. If $2x + 5 = 1$, then $x =$

- a. 3 b. -2 c. 1.5 d. -6

ANS: B PTS: 1

11. If $2x - 4 = 2$, then $x =$

- a. -1 b. 4 c. 3 d. -4

ANS: C PTS: 1

12. If $5 - x = 7$, then $x =$

- a. 2 b. 12 c. -12 d. -2

ANS: D PTS: 1

13. If $1 - 2x = 3$, then $x =$

- a. 2 b. -1 c. -3 d. -2

ANS: B PTS: 1

14. If $\frac{x-2}{3} = 5$, then $x =$

- a. 21 b. 13 c. 17 d. 10

ANS: C PTS: 1

15. If $\frac{x+1}{3} = 2$, then $x =$

- a. 7 b. 3 c. 4 d. 5

ANS: D PTS: 1

16. If $\frac{6}{x+1} = -2$, then $x =$

- a. -4 b. -3 c. 1 d. 2

ANS: A PTS: 1

17. If $\frac{6}{x} + 2 = 0$, then $x =$

- a. 12 b. -3 c. -12 d. 3

ANS: B PTS: 1

18. Solve $3x - 2y = 4$ for x

- a. $x = \frac{4+2y}{3}$ b. $x = 1+2y$ c. $x = \frac{4}{3} + 2y$ d. $x = \frac{4-2y}{3}$

ANS: A PTS: 1

19. Solve $3x + 2y = -4$ for x

- a. $x = \frac{4+2y}{3}$ b. $x = \frac{-4-2y}{3}$ c. $x = \frac{-2}{3}y$ d. $x = -2y$

ANS: B PTS: 1

20. Solve $2x + 3y = -4$ for x

- a. $x = \frac{-4+3y}{2}$ b. $x = -2+1.5y$ c. $x = -2-1.5y$ d. $x = 2-\frac{3y}{2}$

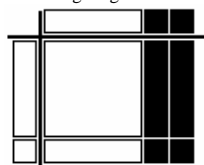
ANS: C PTS: 1

21. Solve $-2x + 3y = 4$ for x

- a. $x = \frac{-4-3y}{2}$ b. $x = 2-\frac{3y}{2}$ c. $x = -2-1.5y$ d. $x = -2+1.5y$

ANS: D PTS: 1

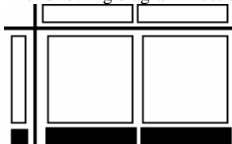
22. The following diagram illustrates that...



- a. $(x+1)(x-2) = x^2 - x - 2$ c. $x^2 - x - 2 = x + 1 + x - 2$
 b. $x + 1 + x - 2 + x^2 - 2x + x - 2 = x^2 + x - 3$ d. $(x-2) - (x+1) = x^2 + 2x - x - 2$

ANS: A PTS: 1

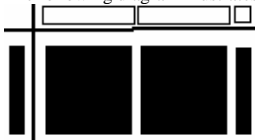
23. The following diagram illustrates that...



- a. $(x-1)(x-2) = 2x^2 - 2x$ c. $2x^2 - 2x = 2x(x-1)$
 b. $x - 1 + 2x + 2x^2 - 2x = 2x^2 + x - 1$ d. $(x-1) - (2x) = x^2 - 2x$

ANS: C PTS: 1

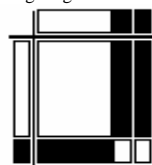
24. The following diagram illustrates that...



- a. $(x-1)(x-2) = 2x^2 - 2x$ c. $-2x^2 + x = (2x+1)(x-1)$
 b. $-x(2x+1) = -2x^2 - x$ d. $(-x) + (2x+1) = -2x^2 - x$

ANS: B PTS: 1

25. The following diagram illustrates that...



- a. $(x-1)(x-2) + x^2 - 3x + 2 = x^2 - x - 1$
 b. $-x(2x+1) = -2x^2 - x$
 c. $x^2 - 3x - 2 = (x-2)(x-1)$
 d. $(x-1)(x-2) = x^2 - 3x + 2$

ANS: D PTS: 1

26. Simplify $x + x + x + x$

- a. $4x^4$ b. $4x$ c. x^4 d. $4x^2$

ANS: B PTS: 1

27. Simplify $(x^2)(x^2)(x^2)$

- a. $3x^2$ b. x^6 c. x^5 d. $3x^6$

ANS: B PTS: 1

28. Simplify $6x^2 - 2x^2$

- a. $6x^2 - 2x^2$ b. 4 c. $4x^2$ d. 3

ANS: C PTS: 1

29. Simplify $\frac{6x^2}{2x^2}$

- a. $3x^2$ b. 4 c. $4x^2$ d. 3

ANS: D PTS: 1

30. Simplify $x^2 + x^2 + x^2$

- a. $3x^2$ b. x^5 c. x^6 d. $3x^6$

ANS: A PTS: 1

31. Simplify $2x^2 + 2x^2 + 2x^2$

- a. $6x^6$ b. $2x^6$ c. $6x^2$ d. $2x^5$

ANS: C PTS: 1

32. Simplify $2x + 2x + 2x$

- a. $6x^3$ b. $2x^3$ c. $6x^2$ d. $6x$

ANS: D PTS: 1

33. Simplify $(2x^2)(2x^2)(2x^2)$
 a. $8x^6$ b. $6x^5$ c. $8x^8$ d. $6x^6$
 ANS: A PTS: 1
34. Simplify $(2x)(2x)(2x)$
 a. $6x^3$ b. $6x$ c. $8x$ d. $8x^3$
 ANS: D PTS: 1
35. Simplify $(3x)(3x)$
 a. $9x$ b. $6x^2$ c. $9x^2$ d. $6x$
 ANS: C PTS: 1
36. Simplify $6x^2 - 2x$
 a. $3x$ b. $4x$ c. $4x^2$ d. $6x^2 - 2x$
 ANS: D PTS: 1
37. Simplify $6x^3 - 2x^3$
 a. $4x^3$ b. $4x$ c. $4x^2$ d. $6x^3 - 2x^3$
 ANS: A PTS: 1
38. Simplify $6x^3 - 2x^2$
 a. $4x$ b. $6x^3 - 2x^2$ c. $4x^2$ d. $3x$
 ANS: B PTS: 1
39. Simplify $\frac{6x^3}{x^3}$
 a. 6 b. $5x^3$ c. $6x$ d. 5
 ANS: A PTS: 1
40. Simplify $\frac{6x^3}{2x}$
 a. $3x^3$ b. $3x^2$ c. $\frac{6x^3}{2x}$ d. $4x^2$
 ANS: B PTS: 1
41. Simplify $\frac{6x^2}{3x^2}$
 a. 3 b. $2x^2$ c. 2 d. $3x^2$
 ANS: C PTS: 1

42. Simplify $2w^2 + w - 3 - 3w^2 + w - 1$
 a. $-w^2 + 2w - 4$ b. $3w^3 - 6w^2 - 1$ c. $-3w^6$ d. $5w^2 + 2$
 ANS: A PTS: 1
43. Simplify $w^2 - 4w + 5 - w^2 + 4w - 3$
 a. $2w^2 - 8w + 2$ b. 2 c. $-8w + 2$ d. $-w^2 + 2$
 ANS: B PTS: 1
44. Simplify $3w^2 - w - 1 - w^2 + 2w - 3$
 a. $2w^2 - 3w - 2$ b. $2w^2 - 3w - 4$ c. $2w^2 + w - 4$ d. $-3w - 1$
 ANS: C PTS: 1
45. Simplify $-w^2 + 3w - 1 - w^2 - 4w + 3$
 a. $-w - 4$ b. $-2w^2 - w - 4$ c. $-2w^2 + 7w + 2$ d. $-2w^2 - w + 2$
 ANS: D PTS: 1
46. Simplify $x - 2y - 1 - 2x + y - 3$
 a. $-x - y - 4$ b. $-3x - 3y - 4$ c. $-2xy - 4$ d. $-x - y - 2$
 ANS: A PTS: 1
47. Simplify $-x + 2y + 1 - 2x + y - 3$
 a. $x + 3y - 2$ b. $-3x + 3y - 2$ c. $x + 3y - 4$ d. $-3x + 3y - 4$
 ANS: B PTS: 1
48. Simplify $3x + 2y - 1 - 2x - y - 3$
 a. $x + y - 2$ b. $x - 3y - 2$ c. $x + y - 4$ d. $x + 3y - 4$
 ANS: C PTS: 1
49. Simplify $-x - 2y + 1 + 2x + y - 3$
 a. $-3x - 3y - 2$ b. $x - 3y - 2$ c. $-3x - y - 2$ d. $x - y - 2$
 ANS: D PTS: 1

2D 03 Linear Relations

MULTIPLE CHOICE

1. Select the table of values for the equation $2x - y = 3$

Select the table of values for the equation $2x - y = 5$.

a.	<table><tr><th>x</th><th>y</th></tr><tr><td>-1</td><td>-5</td></tr><tr><td>0</td><td>-3</td></tr><tr><td>2</td><td>1</td></tr></table>	x	y	-1	-5	0	-3	2	1	b.	<table><tr><th>x</th><th>y</th></tr><tr><td>-1</td><td>-2</td></tr><tr><td>0</td><td>-1</td></tr><tr><td>2</td><td>1</td></tr></table>	x	y	-1	-2	0	-1	2	1	c.	<table><tr><th>x</th><th>y</th></tr><tr><td>-1</td><td>-5</td></tr><tr><td>0</td><td>-3</td></tr><tr><td>2</td><td>-1</td></tr></table>	x	y	-1	-5	0	-3	2	-1	d.	<table><tr><th>x</th><th>y</th></tr><tr><td>-1</td><td>5</td></tr><tr><td>0</td><td>2</td></tr><tr><td>2</td><td>-1</td></tr></table>	x	y	-1	5	0	2	2	-1
x	y																																						
-1	-5																																						
0	-3																																						
2	1																																						
x	y																																						
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x	y																																						
-1	5																																						
0	2																																						
2	-1																																						

ANS: A PTS: 1

2. Select the table of values for the equation $3x - 2y = 2$

a.

x	y
-2	2
0	-1
2	2

b.

x	y
-2	-4
0	-1
4	5

c.

x	y
-2	-2
0	1
2	4

d.

x	y
-2	-2
0	-1
4	5

ANS: B PTS: 1

3. Select the table of values for the equation $2x - 3y = 5$

a.	<table><tr><th>x</th><th>y</th></tr><tr><td>-1</td><td>-3</td></tr><tr><td>1</td><td>-1</td></tr><tr><td>2</td><td>1</td></tr></table>	x	y	-1	-3	1	-1	2	1	b.	<table><tr><th>x</th><th>y</th></tr><tr><td>-2</td><td>-3</td></tr><tr><td>-1</td><td>-1</td></tr><tr><td>4</td><td>1</td></tr></table>	x	y	-2	-3	-1	-1	4	1	c.	<table><tr><th>x</th><th>y</th></tr><tr><td>-2</td><td>-3</td></tr><tr><td>1</td><td>-1</td></tr><tr><td>4</td><td>1</td></tr></table>	x	y	-2	-3	1	-1	4	1	d.	<table><tr><th>x</th><th>y</th></tr><tr><td>-4</td><td>3</td></tr><tr><td>-1</td><td>-1</td></tr><tr><td>2</td><td>-5</td></tr></table>	x	y	-4	3	-1	-1	2	-5
x	y																																						
-1	-3																																						
1	-1																																						
2	1																																						
x	y																																						
-2	-3																																						
-1	-1																																						
4	1																																						
x	y																																						
-2	-3																																						
1	-1																																						
4	1																																						
x	y																																						
-4	3																																						
-1	-1																																						
2	-5																																						

ANS: C PTS: 1

4. Select the table of values for the equation $2x + 3y = -2$

Select the table of values for the equation $2x + 3y = -2$.

a.

x	y
-4	1
-1	0
2	-1

b.

x	y
-4	-2
-1	0
2	2

c.

x	y
4	2
-1	0
-2	-2

d.

x	y
-4	2
-1	0
2	-2

ANS: D PTS: 1

5. Select the table of values for the equation $3x + 2y = -2$

a.

x	y
-2	2
0	-1
4	-7

b.

x	y
2	-2
0	-1
-4	5

c.

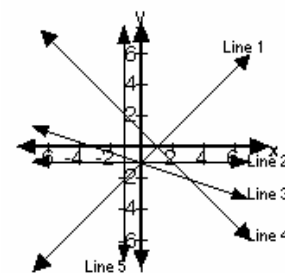
x	y
2	-2
0	-1
-4	7

d.

x	y
-2	2
0	-1
4	-5

ANS: A PTS: 1

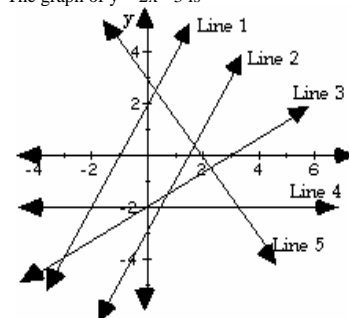
6. The graph of $x - y = 1$ is



- a. Line 1 b. Line 2 c. Line 3 d. Line 4 e. Line 5

ANS: A PTS: 1

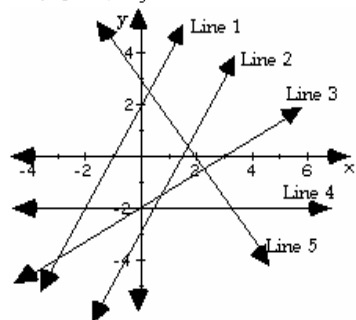
7. The graph of $y = 2x - 3$ is



- a. Line 1 b. Line 2 c. Line 3 d. Line 4 e. Line 5

ANS: B PTS: 1

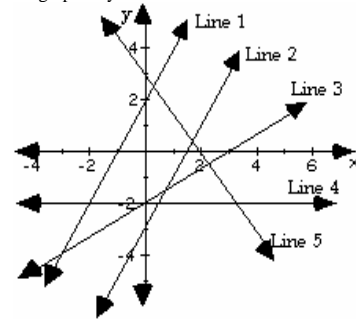
8. The graph of $y = \frac{2}{3}x - 2$ is



- a. Line 1 b. Line 2 c. Line 3 d. Line 4 e. Line 5

ANS: C PTS: 1

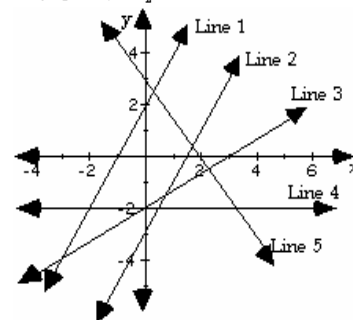
9. The graph of $y = -2$ is



- a. Line 1 b. Line 2 c. Line 3 d. Line 4 e. Line 5

ANS: D PTS: 1

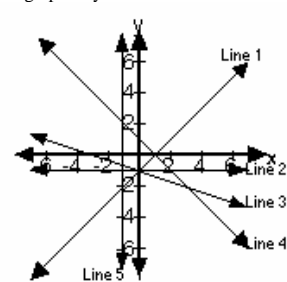
10. The graph of $y = -\frac{3}{2}x + 3$ is



- a. Line 1 b. Line 2 c. Line 3 d. Line 4 e. Line 5

ANS: E PTS: 1

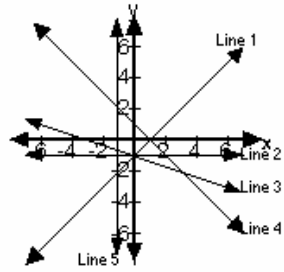
11. The graph of $y = -1$ is



- a. Line 1 b. Line 2 c. Line 3 d. Line 4 e. Line 5

ANS: B PTS: 1

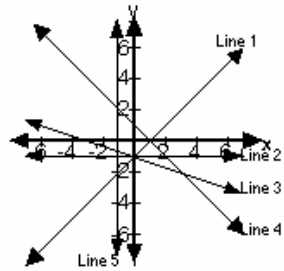
12. The graph of $x+3y = -3$ is



- a. Line 1 b. Line 2 c. Line 3 d. Line 4 e. Line 5

ANS: C PTS: 1

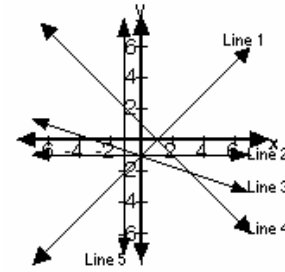
13. The graph of $x+y = 1$ is



- a. Line 1 b. Line 2 c. Line 3 d. Line 4 e. Line 5

ANS: D PTS: 1

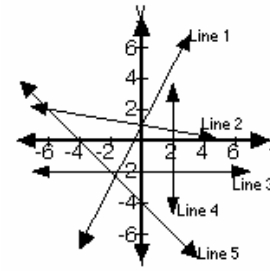
14. The graph of $x=-1$ is



- a. Line 1 b. Line 2 c. Line 3 d. Line 4 e. Line 5

ANS: E PTS: 1

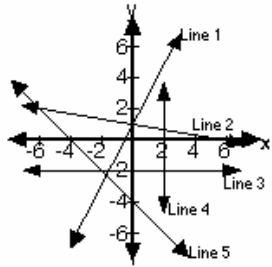
15. The graph of $2x - y = -1$ is



- a. Line 1 b. Line 2 c. Line 3 d. Line 4 e. Line 5

ANS: A PTS: 1

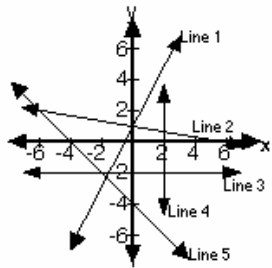
16. The graph of $x + 6y = 6$ is



- a. Line 1 b. Line 2 c. Line 3 d. Line 4 e. Line 5

ANS: B PTS: 1

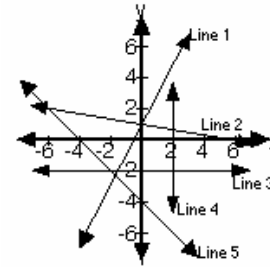
17. The graph of $y = -2$ is



- a. Line 1 b. Line 2 c. Line 3 d. Line 4 e. Line 5

ANS: C PTS: 1

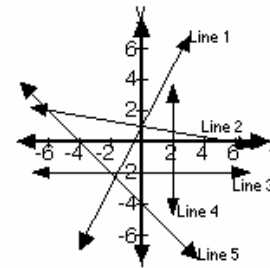
18. The graph of $x = 2$ is



- a. Line 1 b. Line 2 c. Line 3 d. Line 4 e. Line 5

ANS: D PTS: 1

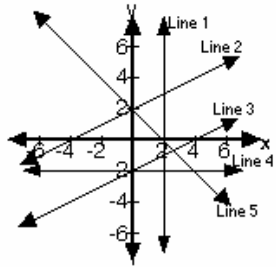
19. The graph of $x + y = -4$ is



- a. Line 1 b. Line 2 c. Line 3 d. Line 4 e. Line 5

ANS: E PTS: 1

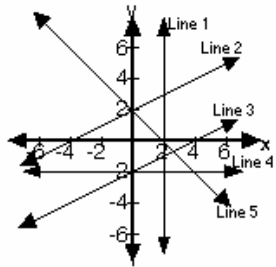
20. The graph of $x - 2y = -4$ is



- a. Line 1 b. Line 2 c. Line 3 d. Line 4 e. Line 5

ANS: B PTS: 1

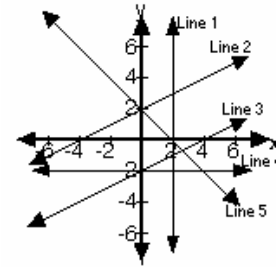
21. The graph of $x - 2y = 4$ is



- a. Line 1 b. Line 2 c. Line 3 d. Line 4 e. Line 5

ANS: C PTS: 1

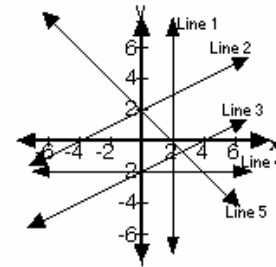
22. The graph of $x + y = 2$ is



- a. Line 1 b. Line 2 c. Line 3 d. Line 4 e. Line 5

ANS: E PTS: 1

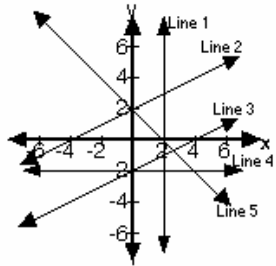
23. The graph of $x = 2$ is



- a. Line 1 b. Line 2 c. Line 3 d. Line 4 e. Line 5

ANS: A PTS: 1

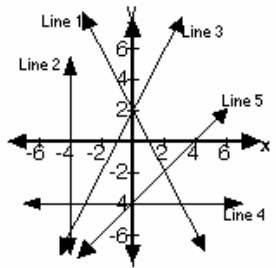
24. The graph of $y = -2$ is



- a. Line 1 b. Line 2 c. Line 3 d. Line 4 e. Line 5

ANS: D PTS: 1

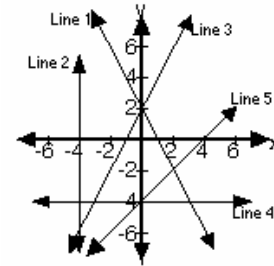
25. The graph of $2x + y = 2$ is



- a. Line 1 b. Line 2 c. Line 3 d. Line 4 e. Line 5

ANS: A PTS: 1

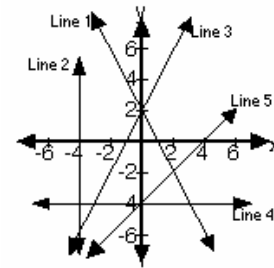
26. The graph of $2x - y = -2$ is



- a. Line 1 b. Line 2 c. Line 3 d. Line 4 e. Line 5

ANS: C PTS: 1

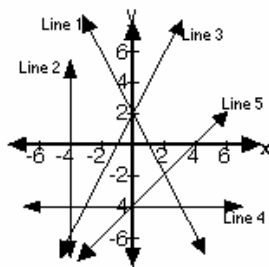
27. The graph of $x - y = 4$ is



- a. Line 1 b. Line 2 c. Line 3 d. Line 4 e. Line 5

ANS: E PTS: 1

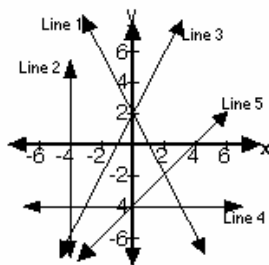
28. The graph of $x = -4$ is



- a. Line 1 b. Line 2 c. Line 3 d. Line 4 e. Line 5

ANS: B PTS: 1

29. The graph of $y = -4$ is



- a. Line 1 b. Line 2 c. Line 3 d. Line 4 e. Line 5

ANS: D PTS: 1

30. A line passes through $A(-2,1)$ and has slope 2. What are the coordinates of another point on the line?

- a. $(-1,3)$ b. $(0,3)$ c. $(-3,3)$ d. $(0,-1)$

ANS: A PTS: 1

31. A line passes through $A(-2,1)$ and has slope $-\frac{1}{2}$. What are the coordinates of another point on the line?

- a. $(-3,-1)$ b. $(0,0)$ c. $(-3,3)$ d. $(0,-1)$

ANS: B PTS: 1

32. A line passes through $A(-2,1)$ and has slope $\frac{1}{2}$. What are the coordinates of another point on the line?

- a. $(-3,-1)$ b. $(0,0)$ c. $(-3,3)$ d. $(0,2)$

ANS: D PTS: 1

33. A line passes through $A(-2,1)$ and has slope -2. What are the coordinates of another point on the line?

- a. $(-4,2)$ b. $(-1,3)$ c. $(-1,-1)$ d. $(0,2)$

ANS: C PTS: 1

34. A line has equation $2x - 3y = 5$. Its slope is

- a. $\frac{2}{3}$ b. $-\frac{3}{2}$ c. $-\frac{2}{3}$ d. $\frac{3}{2}$

ANS: A PTS: 1

35. A line has equation $3x + 2y = 5$. Its slope is

- a. $\frac{2}{3}$ b. $-\frac{3}{2}$ c. $-\frac{2}{3}$ d. $\frac{3}{2}$

ANS: B PTS: 1

36. A line has equation $2x + 3y = 5$. Its slope is

- a. $\frac{2}{3}$ b. $-\frac{3}{2}$ c. $-\frac{2}{3}$ d. $\frac{3}{2}$

ANS: C PTS: 1

37. A line has equation $3x - 2y = 5$. Its slope is

- a. $\frac{2}{3}$ b. $-\frac{3}{2}$ c. $-\frac{2}{3}$ d. $\frac{3}{2}$

ANS: D PTS: 1

38. A line has equation $2x - 3y = 5$. Its y-intercept is

- a. $\frac{5}{3}$ b. $-\frac{5}{2}$ c. $-\frac{5}{3}$ d. $\frac{5}{2}$

ANS: C PTS: 1

39. A line has equation $3x + 2y = 5$. Its y-intercept is

- a. $\frac{5}{3}$ b. $-\frac{5}{2}$ c. $-\frac{5}{3}$ d. $\frac{5}{2}$

ANS: D PTS: 1

40. A line has equation $2x + 3y = 5$. Its y-intercept is

- a. $\frac{5}{3}$ b. $-\frac{5}{2}$ c. $-\frac{5}{3}$ d. $\frac{5}{2}$

ANS: A PTS: 1

41. A line has equation $3x - 2y = 5$. Its y-intercept is

- a. $\frac{5}{3}$ b. $-\frac{5}{2}$ c. $-\frac{5}{3}$ d. $\frac{5}{2}$

ANS: B PTS: 1

42. A line has equation $2x - 3y = 5$. Its x-intercept is

- a. $\frac{5}{3}$ b. $-\frac{5}{2}$ c. $-\frac{5}{3}$ d. $\frac{5}{2}$

ANS: D PTS: 1

43. A line has equation $2x - 3y = -5$. Its x-intercept is

- a. $\frac{5}{3}$ b. $-\frac{5}{2}$ c. $-\frac{5}{3}$ d. $\frac{5}{2}$

ANS: B PTS: 1

44. A line has equation $3x - 2y = 5$. Its x-intercept is

- a. $\frac{5}{3}$ b. $-\frac{5}{2}$ c. $-\frac{5}{3}$ d. $\frac{5}{2}$

ANS: A PTS: 1

45. A line has equation $3x - 2y = -5$. Its x-intercept is

- a. $\frac{5}{3}$ b. $-\frac{5}{2}$ c. $-\frac{5}{3}$ d. $\frac{5}{2}$

ANS: C PTS: 1

2D 04 Systems of Equations

MULTIPLE CHOICE

1. Solve $a + 3b = -1$

$$2a - b = 5$$

- a. $a=2$ & $b=-1$ b. $a=-4$ & $b=1$ c. $a=3$ & $b=1$ d. $a=1$ & $b=-3$

ANS: A PTS: 1

2. Solve $a + 3b = -1$

$$2a + b = -7$$

- a. $a=2$ & $b=-1$ b. $a=-4$ & $b=1$ c. $a=5$ & $b=-2$ d. $a=-3$ & $b=-1$

ANS: B PTS: 1

3. Solve $a + 3b = -1$

$$2a + b = 8$$

- a. $a=2$ & $b=-1$ b. $a=-4$ & $b=1$ c. $a=5$ & $b=-2$ d. $a=-3$ & $b=-1$

ANS: C PTS: 1

4. Solve $3a + 2b = -3$

$$2a - b = 5$$

- a. $a=2$ & $b=-1$ b. $a=-2$ & $b=3$ c. $a=-1$ & $b=-7$ d. $a=1$ & $b=-3$

ANS: D PTS: 1

5. Solve $a = 2b + 3$

$$a = 4b + 1$$

- a. $a=5$ & $b=1$ b. $a=7$ & $b=2$ c. $a=3$ & $b=0$ d. $a=-3$ & $b=-1$

ANS: A PTS: 1

6. Solve $a = 2b + 3$

$$a = 4b + 5$$

- a. $a=5$ & $b=1$ b. $a=1$ & $b=-1$ c. $a=3$ & $b=0$ d. $a=-3$ & $b=-2$

ANS: B PTS: 1

7. Solve $a = 2b + 3$

$$a = 4b + 7$$

- a. $a=5$ & $b=1$ b. $a=1$ & $b=-1$ c. $a=-1$ & $b=-2$ d. $a=-3$ & $b=-2$

ANS: C PTS: 1

8. Solve $a = 2b - 3$
 $a = 3b - 4$
 a. $a=1$ & $b=-1$ b. $a=2$ & $b=2$ c. $a=1$ & $b=-2$ d. $a=-1$ & $b=1$
 ANS: D PTS: 1
9. d represents the number of dimes and q represents the number of quarters. Choose the equation corresponding to the statement "The total number of coins is 23".
 a. $d + q = 23$ b. $10d + 25q = 23$ c. $0.1d + 0.25q = 23$ d. $0.01d + 0.25q = 23$
 ANS: A PTS: 1
10. d represents the number of dimes and q represents the number of quarters. Choose the equation corresponding to the statement "There are 3 more dimes than quarters".
 a. $d + 3 = q$ b. $d = q + 3$ c. $10d = 25q + 3$ d. $25q - 10d = 3$
 ANS: B PTS: 1
11. d represents the number of dimes and q represents the number of quarters. Choose the equation corresponding to the statement "There are 3 more quarters than dimes".
 a. $d + 3 = q$ b. $d = q + 3$ c. $10d = 25q + 3$ d. $25q - 10d = 3$
 ANS: A PTS: 1
12. d represents the number of dimes and q represents the number of quarters. Choose the equation corresponding to the statement "The total value of the coins is \$2.30".
 a. $d + q = 230$ b. $10d + 25q = 23$ c. $0.1d + 0.25q = 2.3$ d. $0.01d + 0.25q = 2.3$
 ANS: C PTS: 1
13. d represents the number of dimes and q represents the number of quarters. Choose the equation corresponding to the statement "There are 3 more dimes than quarters".
 a. $d + 3 = q$ b. $10d = 25q + 3$ c. $10d - 25q = 3$ d. $d - q = 3$
 ANS: D PTS: 1
14. d represents the number of dimes and q represents the number of quarters. Choose the equation corresponding to the statement "There are 3 times as many dimes as quarters".
 a. $q = d + 3$ b. $q = 3d$ c. $d = 3q$ d. $d - q = 3$
 ANS: C PTS: 1
15. d represents the number of dimes and q represents the number of quarters. Choose the equation corresponding to the statement "There are 3 fewer dimes than quarters".
 a. $d - 3 = q$ b. $q - d = 3$ c. $10d = 25q + 3$ d. $d - q = 3$
 ANS: B PTS: 1
16. d represents the number of dimes and q represents the number of quarters. Choose the equation corresponding to the statement "The dimes are worth \$5 more than the quarters".
 a. $10d - 5 = 25q$ b. $0.25q - 0.1d = 5$ c. $10d = 25q - 500$ d. $10d - 25q = 500$
 ANS: D PTS: 1

17. d represents the number of dimes and q represents the number of quarters. Choose the equation corresponding to the statement "The dimes are worth \$5 less than the quarters".
 a. $10d - 5 = 25q$ b. $0.25q - 0.1d = 5$ c. $d = q - 5$ d. $10d - 25q = 500$
 ANS: B PTS: 1
18. If I have to run x km at 8 km/h, then what represents the time it will take me in h?
 a. $8x$ b. $\frac{x}{8}$ c. $\frac{8}{x}$
 ANS: B PTS: 1
19. If I have to run 8 km in x hours, then what represents the average speed in km/h?
 a. $8x$ b. $\frac{x}{8}$ c. $\frac{8}{x}$
 ANS: C PTS: 1
20. If I have to run for 8 hours at x km/h, then what represents the distance in km?
 a. $8x$ b. $\frac{x}{8}$ c. $\frac{8}{x}$
 ANS: A PTS: 1
21. If I have to run 8 km at x km/h, then what represents the time it will take me in h?
 a. $8x$ b. $\frac{x}{8}$ c. $\frac{8}{x}$
 ANS: C PTS: 1
22. If I have to run x km in 8 hours, then what represents the average speed in km/h?
 a. $8x$ b. $\frac{x}{8}$ c. $\frac{8}{x}$
 ANS: B PTS: 1
23. If I have to run for x hours at 8 km/h, then what represents the distance in km?
 a. $8x$ b. $\frac{x}{8}$ c. $\frac{8}{x}$
 ANS: A PTS: 1
24. Which method would be easiest to solve the system:
 $y = \sqrt{x} + 3$
 $y = x^2 - 5x$
 a. graphing b. substitution c. elimination
 ANS: A PTS: 1

25. Which method would be easiest to solve the system:
 $y = 2x^2 + 1$
 $y = 73x^2 - 5x$
 a. graphing b. substitution c. elimination
 ANS: A PTS: 1

26. Which method would be easiest to solve the system:
 $y = 5x + 7$
 $y = \frac{4}{x}$
 a. graphing b. substitution c. elimination
 ANS: A PTS: 1

27. Which method would be easiest to solve the system:
 $y = 7.9x^2 + 3.1x + 2$
 $y = -x^3$
 a. graphing b. substitution c. elimination
 ANS: A PTS: 1

28. Which method would be easiest to solve the system:
 $2x + 7y = 11$
 $y = 4x - 1$
 a. graphing b. substitution c. elimination
 ANS: B PTS: 1

29. Which method would be easiest to solve the system:
 $y = -x + 2$
 $2x + 11y = 23$
 a. graphing b. substitution c. elimination
 ANS: B PTS: 1

30. Which method would be easiest to solve the system:
 $5x + 3y = 11$
 $x = 5 - 2y$
 a. graphing b. substitution c. elimination
 ANS: B PTS: 1

31. Which method would be easiest to solve the system:
 $x = 2 - 5y$
 $5x - 7y = 2$
 a. graphing b. substitution c. elimination
 ANS: B PTS: 1

32. Which method would be easiest to solve the system:
 $-2x + 3y = 5$
 $2x - 7y = 2$
 a. graphing b. substitution c. elimination
 ANS: C PTS: 1

33. Which method would be easiest to solve the system:
 $3x + 7y = 5$
 $2x - 7y = 2$
 a. graphing b. substitution c. elimination
 ANS: C PTS: 1

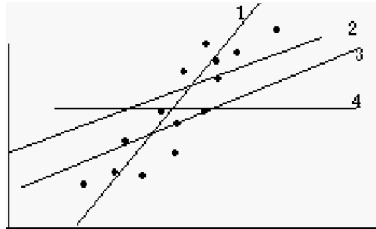
34. Which method would be easiest to solve the system:
 $17x = 3y + 5$
 $2x = -3y + 2$
 a. graphing b. substitution c. elimination
 ANS: C PTS: 1

35. Which method would be easiest to solve the system:
 $-4x + 3y = 5$
 $4x - 7y = 2$
 a. graphing b. substitution c. elimination
 ANS: C PTS: 1

2D 05 TI-83 Linear Relations

MULTIPLE CHOICE

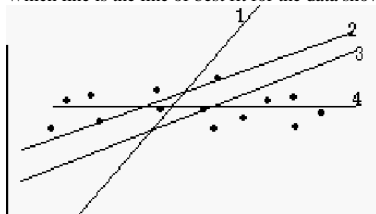
1. Which line is the line of best fit for the data shown below?



- a. line 1 b. line 2 c. line 3

ANS: A PTS: 1

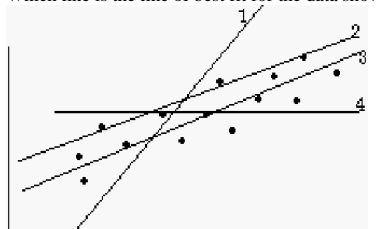
2. Which line is the line of best fit for the data shown below?



- a. line 1 b. line 2 c. line 3

ANS: D PTS: 1

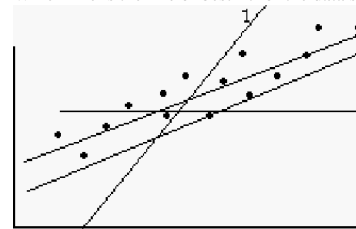
3. Which line is the line of best fit for the data shown below?



- a. line 1 b. line 2 c. line 3

ANS: C PTS: 1

4. Which line is the line of best fit for the data shown below?



- a. line 1 b. line 2 c. line 3 d. line 4

ANS: B PTS: 1

5. Use a TI-83 to find the equation of the line of best fit and the correlation coefficient (rounded to 2 decimal places) for the following data:

<i>Length(cm)</i>	<i>Height(cm)</i>
24	165
28	185
32	190
26	170

- a. $y = 3.29x + 87.14$ and $r = 0.94$ c. $y = 3.07x + 94.29$ and $r = 0.95$
 b. $y = 3.93x + 70.71$ and $r = 0.97$ d. $y = 3.21x + 87.86$ and $r = 0.99$

ANS: A PTS: 1

6. Use a TI-83 to find the equation of the line of best fit and the correlation coefficient (rounded to 2 decimal places) for the following data:

<i>Length(cm)</i>	<i>Height(cm)</i>
24	165
28	185
32	195
26	170

- a. $y = 3.29x + 87.14$ and $r = 0.94$ c. $y = 3.07x + 94.29$ and $r = 0.95$
 b. $y = 3.93x + 70.71$ and $r = 0.97$ d. $y = 3.21x + 87.86$ and $r = 0.99$

ANS: B PTS: 1

7. Use a TI-83 to find the equation of the line of best fit and the correlation coefficient (rounded to 2 decimal places) for the following data:

Length(cm)	Height(cm)
24	165
28	185
32	190
26	175

- a. $y = 3.29x + 87.14$ and $r = 0.94$
b. $y = 3.93x + 70.71$ and $r = 0.97$
c. $y = 3.07x + 94.29$ and $r = 0.95$
d. $y = 3.21x + 87.86$ and $r = 0.99$

ANS: C PTS: 1

8. Use a TI-83 to find the equation of the line of best fit and the correlation coefficient (rounded to 2 decimal places) for the following data:

Length(cm)	Height(cm)
24	165
28	180
32	190
26	170

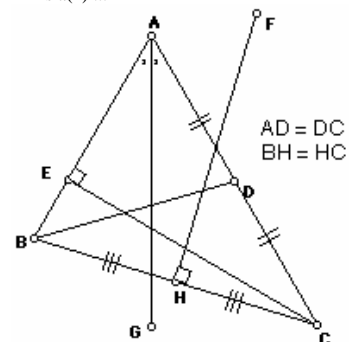
- a. $y = 3.29x + 87.14$ and $r = 0.94$
b. $y = 3.93x + 70.71$ and $r = 0.97$
c. $y = 3.07x + 94.29$ and $r = 0.95$
d. $y = 3.21x + 87.86$ and $r = 0.99$

ANS: D PTS: 1

2D 06 Analytic Geometry

MULTIPLE CHOICE

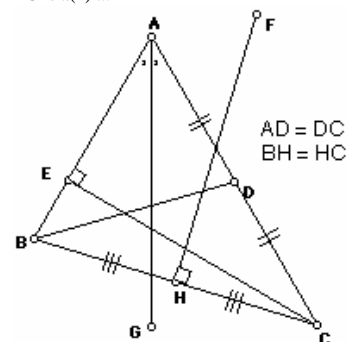
1. FH is a(n) ...



- a. altitude of $\triangle ABC$ b. median of $\triangle ABC$ c. right bisector of a line segment d. angle bisector

ANS: C PTS: 1

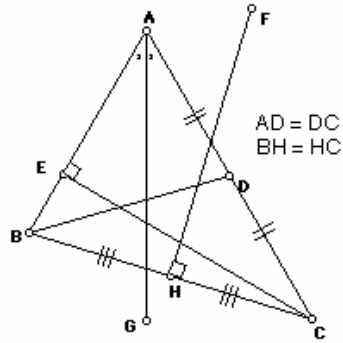
2. AG is a(n) ...



- a. altitude of $\triangle ABC$ b. median of $\triangle ABC$ c. right bisector of a line segment d. angle bisector

ANS: D PTS: 1

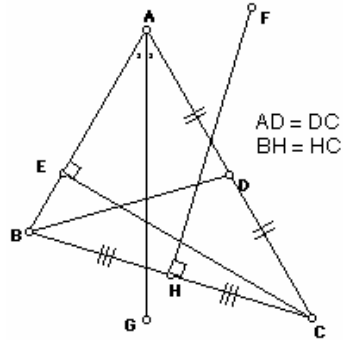
3. BD is a(n) ...



- a. altitude of $\triangle ABC$ b. median of $\triangle ABC$ c. right bisector of a line segment d. angle bisector

ANS: B PTS: 1

4. CE is a(n) ...



- a. altitude of $\triangle ABC$ b. median of $\triangle ABC$ c. right bisector of a line segment d. angle bisector

ANS: A PTS: 1

5. Given points A(6,3) and B(4,-1). The midpoint is at

- a. (5,1) b. (5,2) c. (2, 4) d. (1,2)

ANS: A PTS: 1

6. Given points A(6,3) and B(4,1). The midpoint is at

- a. (5,1) b. (5,2) c. (2, 2) d. (1,1)

ANS: B PTS: 1

7. Given points A(6,3) and B(-2,-1). The midpoint is at

- a. (4,2) b. (8,4) c. (2, 1) d. (3,2)

ANS: C PTS: 1

8. Given points A(6,3) and B(-4,1). The midpoint is at

- a. (5,2) b. (2,4) c. (10, 2) d. (1,2)

ANS: D PTS: 1

9. Given points A(6,3) and B(3,-1). The distance between A and B is approximately

- a. 4.5 b. 5 c. 7 d. 2.6

ANS: B PTS: 1

10. Given points A(6,2) and B(3,-1). The distance between A and B is approximately

- a. 6.0 b. 5 c. 4.2 d. 9.5

ANS: C PTS: 1

11. Given points A(6,2) and B(-3,-1). The distance between A and B is approximately

- a. 6.0 b. 5 c. 4.2 d. 9.5

ANS: D PTS: 1

12. Given points A(6,3) and B(4,-1). The distance between A and B is approximately

- a. 4.5 b. 5 c. 7 d. 2.6

ANS: A PTS: 1

13. Given points A(6,3) and B(4,-1). The slope of AB is

- a. 2 b. -0.5 c. -2 d. 0.5

ANS: A PTS: 1

14. Given points A(6,3) and B(8,-1). The slope of AB is

- a. 2 b. -0.5 c. -2 d. 0.5

ANS: C PTS: 1

15. Given points A(6,3) and B(-2,-1). The slope of AB is

- a. 2 b. -0.5 c. -2 d. 0.5

ANS: D PTS: 1

16. Given points A(6,3) and B(2,5). The slope of AB is

- a. 2 b. -0.5 c. -2 d. 0.5

ANS: B PTS: 1

2D 07 Non-Linear Relationships and Exponents

MULTIPLE CHOICE

1. What does it appear that the missing number in the table should be?

x	-3	-2	-1	0	1	2	3
y	$\frac{1}{125}$	$\frac{1}{25}$	$\frac{1}{5}$	1	5	?	125

- a. 25 b. 10 c. 9 d. 123

ANS: A

2. What does it appear that the missing number in the table should be?

x	-3	-2	-1	0	1	2	3
y	$\frac{1}{64}$	$\frac{1}{16}$?	1	4	16	64

- a. $\frac{1}{4}$ b. -4 c. -3 d. $\frac{1}{8}$

ANS: A

3. What does it appear that the missing number in the table should be?

x	-3	-2	-1	0	1	2	3
y	$\frac{1}{64}$	$\frac{1}{16}$	$\frac{1}{4}$?	4	16	64

- a. 1 b. 0 c. $\frac{1}{2}$ d. -8

ANS: A

4. What does it appear that the missing number in the table should be?

x	-3	-2	-1	0	1	2	3
y	$\frac{1}{27}$?	$\frac{1}{3}$	1	3	9	27

- a. $\frac{1}{9}$ b. $\frac{1}{6}$ c. $\frac{1}{21}$ d. $\frac{1}{24}$

ANS: A

5. What does it appear that the missing number in the table should be?

x	-3	-2	-1	0	1	2	3
y	4	6	10	?	24	34	46

- a. 16 b. 17 c. 18 d. 15

ANS: A

17. The slope of a line segment is -3. The slope of a parallel line is
a. -3 b. 3 c. $-\frac{1}{3}$ d. $\frac{1}{3}$

ANS: A PTS: 1

18. The slope of a line segment is 3. The slope of a parallel line is
a. -3 b. 3 c. $-\frac{1}{3}$ d. $\frac{1}{3}$

ANS: B PTS: 1

19. The slope of a line segment is $-\frac{1}{3}$. The slope of a parallel line is
a. -3 b. 3 c. $-\frac{1}{3}$ d. $\frac{1}{3}$

ANS: C PTS: 1

20. The slope of a line segment is $\frac{1}{3}$. The slope of a parallel line is
a. -3 b. 3 c. $-\frac{1}{3}$ d. $\frac{1}{3}$

ANS: D PTS: 1

21. The slope of a line segment is $\frac{1}{3}$. The slope of a perpendicular line is
a. -3 b. 3 c. $-\frac{1}{3}$ d. $\frac{1}{3}$

ANS: A PTS: 1

22. The slope of a line segment is $-\frac{1}{3}$. The slope of a perpendicular line is
a. -3 b. 3 c. $-\frac{1}{3}$ d. $\frac{1}{3}$

ANS: B PTS: 1

23. The slope of a line segment is 3. The slope of a perpendicular line is
a. -3 b. 3 c. $-\frac{1}{3}$ d. $\frac{1}{3}$

ANS: C PTS: 1

24. The slope of a line segment is -3. The slope of a perpendicular line is
a. -3 b. 3 c. $-\frac{1}{3}$ d. $\frac{1}{3}$

ANS: D PTS: 1

6. What does it appear that the missing number in the table should be?

x	-3	-2	-1	0	1	2	3
y	4	6	10	?	24	34	46

- a. 16 b. 17 c. 18 d. 15

ANS: A

7. What does it appear that the missing number in the table should be?

x	-3	-2	-1	0	1	2	3
y	3	5	?	15	23	33	45

- a. 9 b. 10 c. 11 d. 8

ANS: A

8. What does it appear that the missing number in the table should be?

x	-3	-2	-1	0	1	2	3
y	-1	0	?	5	9	14	20

- a. 2 b. 2.5 c. 3 d. 1.5

ANS: A

9. $4^7 \times 4^{-2}$ is equal to...

- a. 4^5 b. 4^{-14} c. 16^5 d. 16^{-14}

ANS: A

10. $7^6 \times 7^{-3}$ is equal to...

- a. 7^3 b. 7^{-18} c. 49^3 d. 49^{-18}

ANS: A

11. $(3^2)^5$ is equal to...

- a. 3^{10} b. 3^7 c. 243^{10} d. 243^7

ANS: A

12. $(4^5)^2$ is equal to...

- a. 4^{10} b. 4^7 c. 16^{10} d. 16^7

ANS: A

13. $\frac{5^5}{5^{-3}}$ simplifies to...

- a. 5^{10} b. 5^{-1} c. 1^{10} d. 1^{-1}

ANS: A

14. $\frac{4^{15}}{4^{-5}}$ simplifies to...

- a. 4^{20} b. 4^{-3} c. 1^{20} d. 1^{-3}

ANS: A

15. 5^{-6} is equal to...

- a. $\frac{1}{15625}$ b. $\frac{1}{30}$ c. -15625 d. $\frac{-6}{5}$

ANS: A

16. 4^{-3} is equal to...

- a. $\frac{1}{64}$ b. $\frac{1}{12}$ c. -64 d. $\frac{-3}{4}$

ANS: A

17. 4^{-3} is equal to...

- a. $\frac{1}{64}$ b. $\frac{1}{12}$ c. -64 d. $\frac{-3}{4}$

ANS: A

18. 7^{-3} is equal to...

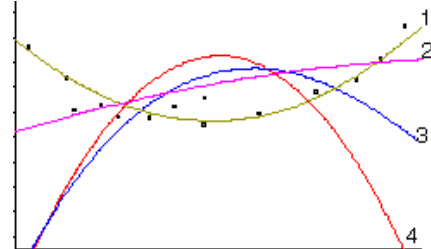
- a. $\frac{1}{343}$ b. $\frac{1}{21}$ c. -343 d. $\frac{-3}{7}$

ANS: A

2D 08 Quadratics and Systems on TI-83

MULTIPLE CHOICE

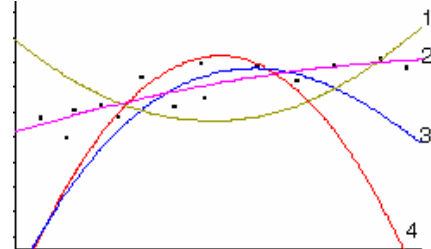
1. Which curve best fits the data shown?



a. curve1 b. curve 2 c. curve 3

ANS: A PTS: 1

2. Which curve best fits the data shown?

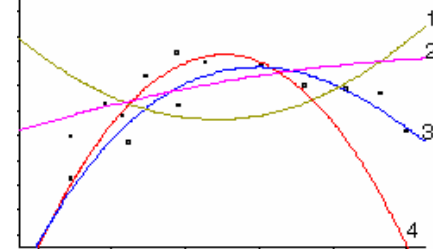


a. curve1 b. curve 2 c. curve 3

ANS: B PTS: 1

d. curve 4

3. Which curve best fits the data shown?

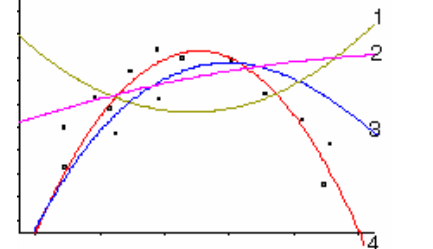


a. curve1 b. curve 2 c. curve 3

ANS: C PTS: 1

d. curve 4

4. Which curve best fits the data shown?



a. curve1 b. curve 2 c. curve 3

ANS: D PTS: 1

d. curve 4

5. Use a TI-83 to find the equation of the parabola of best fit and the value of R^2 (rounded to 2 decimal places) for the following data:

Length(cm)	Height(cm)
24	165
28	185
32	190
26	170

a. $y = -0.31x^2 + 20.88x - 157.50$ and $R^2 = 0.94$

b. $y = -0.17x^2 + 13.52x - 62.73$ and $R^2 = 0.96$

c. $y = -0.43x^2 + 27.06x - 239.32$ and $R^2 = 0.99$

d. $y = -0.09x^2 + 8.01x + 21.14$ and $R^2 = 0.98$

ANS: A PTS: 1

6. Use a TI-83 to find the equation of the parabola of best fit and the value of R^2 (rounded to 2 decimal places) for the following data:

Length(cm)	Height(cm)
24	165
28	185
32	195
26	170

- a. $y = -0.31x^2 + 20.88x - 157.50$ and $R^2 = 0.94$
b. $y = -0.17x^2 + 13.52x - 62.73$ and $R^2 = 0.96$
c. $y = -0.43x^2 + 27.06x - 239.32$ and $R^2 = 0.99$
d. $y = -0.09x^2 + 8.01x + 21.14$ and $R^2 = 0.98$

ANS: B PTS: 1

7. Use a TI-83 to find the equation of the parabola of best fit and the value of R^2 (rounded to 2 decimal places) for the following data:

Length(cm)	Height(cm)
24	165
28	185
32	190
26	175

- a. $y = -0.31x^2 + 20.88x - 157.50$ and $R^2 = 0.94$
b. $y = -0.17x^2 + 13.52x - 62.73$ and $R^2 = 0.96$
c. $y = -0.43x^2 + 27.06x - 239.32$ and $R^2 = 0.99$
d. $y = -0.09x^2 + 8.01x + 21.14$ and $R^2 = 0.98$

ANS: C PTS: 1

8. Use a TI-83 to find the equation of the parabola of best fit and the value of R^2 (rounded to 2 decimal places) for the following data:

Length(cm)	Height(cm)
24	165
28	180
32	190
26	170

- a. $y = -0.31x^2 + 20.88x - 157.50$ and $R^2 = 0.94$
b. $y = -0.17x^2 + 13.52x - 62.73$ and $R^2 = 0.96$
c. $y = -0.43x^2 + 27.06x - 239.32$ and $R^2 = 0.99$
d. $y = -0.09x^2 + 8.01x + 21.14$ and $R^2 = 0.98$

ANS: D PTS: 1

9. Determine the zeros (2 decimal places) of the relation with equation $y = 4.3x^2 - x - 11$
a. 1.72, -1.49 b. 0.72, -0.30 c. 0.88, -0.24 d. 0.94, -0.25

ANS: A PTS: 1

10. Determine the zeros (2 decimal places) of the relation with equation $y = 4.7x^2 - 2x - 1$
a. 1.72, -1.49 b. 0.72, -0.30 c. 0.88, -0.24 d. 0.94, -0.25

ANS: B PTS: 1

11. Determine the zeros (2 decimal places) of the relation with equation $y = 4.7x^2 - 3x - 1$
a. 1.72, -1.49 b. 0.72, -0.30 c. 0.88, -0.24 d. 0.94, -0.25

ANS: C PTS: 1

12. Determine the zeros (2 decimal places) of the relation with equation $y = 4.3x^2 - 3x - 1$
a. 1.72, -1.49 b. 0.72, -0.30 c. 0.88, -0.24 d. 0.94, -0.25

ANS: D PTS: 1

13. One solution to the system $y = 4.3x^2 - 3x - 1$ is approximately
 $y = 2x + 5$
a. $x=1.90, y=8.80$ b. $x=1.78, y=8.56$ c. $x=1.63, y=8.27$ d. $x=2.31, y=9.62$

ANS: A PTS: 1

14. One solution to the system $y = 4.7x^2 - 3x - 1$ is approximately
 $y = 2x + 5$
a. $x=1.90, y=8.80$ b. $x=1.78, y=8.56$ c. $x=1.63, y=8.27$ d. $x=2.31, y=9.62$

ANS: B PTS: 1

15. One solution to the system $y = 4.7x^2 - 2x - 1$ is approximately
 $y = 2x + 5$
a. $x=1.90, y=8.80$ b. $x=1.78, y=8.56$ c. $x=1.63, y=8.27$ d. $x=2.31, y=9.62$

ANS: C PTS: 1

16. One solution to the system $y = 4.3x^2 - x - 11$ is approximately
 $y = 2x + 5$
a. $x=1.90, y=8.80$ b. $x=1.78, y=8.56$ c. $x=1.63, y=8.27$ d. $x=2.31, y=9.62$

ANS: D PTS: 1

2D 09 Quadratic Relations Part I

MULTIPLE CHOICE

1. The first relationship is defined by the table of values:

n	C
0	-4
1	-1
2	2
3	5
4	8

- A second relationship is defined by its table of values:

n	C
0	1
1	4
2	9
3	16
4	25

Which of these relationships is linear or quadratic?

- a. 1st is linear & 2nd is quadratic b. both are linear c. both are quadratic d. some other combination

ANS: A PTS: 1

2. The first relationship is defined by the table of values:

n	C
0	-4
1	-2
2	2
3	4
4	6

- A second relationship is defined by its table of values:

n	C
0	16
1	8
2	4
3	2
4	1

Which of these relationships is linear or quadratic?

- a. 1st is linear and the 2nd is quadratic b. 1st is linear and the 2nd is neither c. 1st is neither and the 2nd is quadratic d. some other combination

ANS: D PTS: 1

3. The first relationship is defined by the table of values:

n	C
0	10
1	3
2	0
3	1
4	6

- A second relationship is defined by its table of values:

n	C
0	10
2	8
4	6
6	4
8	2

Which of these relationships is linear or quadratic?

- a. 1st is neither & the 2nd one is linear b. 1st is quadratic & the 2nd is linear c. 1st is quadratic & the 2nd is neither d. some other combination

ANS: B PTS: 1

4. The first relationship is defined by the table of values:

n	C
0	-4
1	-1
2	2
3	5
6	8

- A second relationship is defined by its table of values:

n	C
0	1
1	4
2	7
3	10
4	13

Which of these relationships is linear or quadratic?

- a. both are linear b. 1st is linear & 2nd is quadratic c. 1st is neither & 2nd is linear d. some other combination

ANS: C PTS: 1

5. The first relationship is defined by the table of values:

n	C
0	5
1	1
2	-3
3	-7
4	-11

- A second relationship is defined by its table of values:

n	C
0	7
1	4
2	1
3	4
4	7

Which of these relationships is linear or quadratic?

- a. both are linear b. 1st is linear & 2nd is quadratic c. both are quadratic d. some other combination

ANS: D PTS: 1

6. The first relationship is defined by the table of values:

n	C
0	-4
1	-1
2	4
3	11
4	20

- A second relationship is defined by its table of values:

n	C
0	17
1	16
2	14
3	11
4	7

Which of these relationships is linear or quadratic?

- a. both are quadratic b. 1st is quadratic & 2nd is linear c. 1st is quadratic & the 2nd is neither d. some other combination

ANS: A PTS: 1

7. The first relationship is defined by the table of values:

n	C
0	-3
1	-1
2	3
3	5
4	7

- A second relationship is defined by its table of values:

n	C
0	-3
1	2
2	7
3	12
4	17

Which of these relationships is linear or quadratic?

- a. both are linear b. 1st is neither & 2nd is linear c. 1st is neither & 2nd is quadratic d. some other combination

ANS: B PTS: 1

8. The first relationship is defined by the table of values:

n	C
0	-5
1	-2
2	1
3	4
4	9

- A second relationship is defined by its table of values:

n	C
0	1
1	-1
2	0
3	4
4	11

Which of these relationships is linear or quadratic?

- a. 1st is linear & 2nd is quadratic b. both are neither c. 1st is neither & 2nd is quadratic d. some other combination

ANS: C PTS: 1

9. A parabola has zeros at -1 and 7. The equation of the axis of symmetry is

- a. $x = 3$ b. $x = 6$ c. $x = 4$ d. $x = 3.5$

ANS: A PTS: 1

10. A parabola has zeros at -1 and 13. The equation of the axis of symmetry is

- a. $x = 7$ b. $x = 6$ c. $x = 12$ d. $x = 6.5$

ANS: B PTS: 1

11. A parabola has zeros at -7 and 1. The equation of the axis of symmetry is

- a. $x = 3$ b. $x = -6$ c. $x = -3$ d. $x = -4$

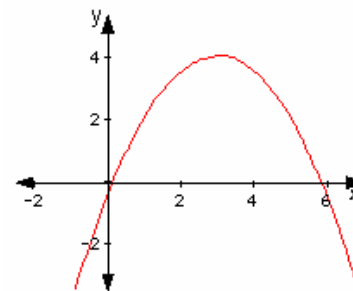
ANS: C PTS: 1

12. A parabola has zeros at -6 and 1. The equation of the axis of symmetry is

- a. $x = -5$ b. $x = -3.5$ c. $x = -3$ d. $x = -2.5$

ANS: D PTS: 1

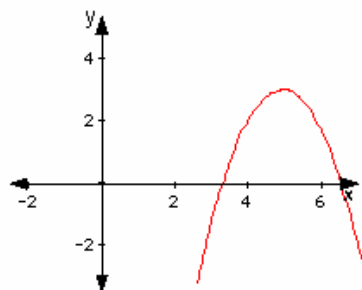
13. The graph of a parabola is shown below. Its maximum value is



- a. 4 b. 3 c. 6.5 d. 7

ANS: A PTS: 1

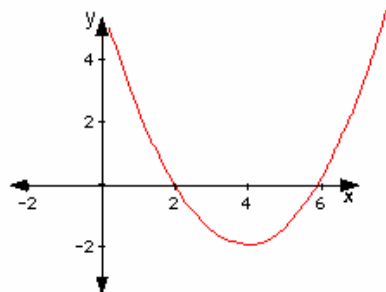
14. The graph of a parabola is shown below. Its maximum value is



- a. 4 b. 3 c. 5 d. 7

ANS: B PTS: 1

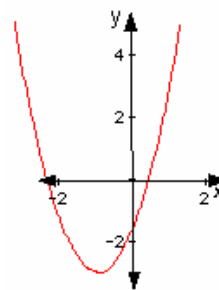
15. The graph of a parabola is shown below. Its minimum value is



- a. 0 b. 4 c. -2 d. -1

ANS: C PTS: 1

16. The graph of a parabola is shown below. Its minimum value is



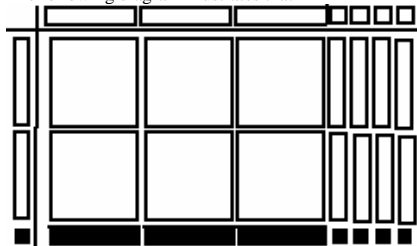
- a. -2 b. -1 c. 1 d. -3

ANS: D PTS: 1

2D 10 Factoring and Quadratic Equations

MULTIPLE CHOICE

1. The following diagram illustrates that



- a. $6x^2 + 5x - 4 = (2x - 1)(3x + 4)$ c. $6x^2 + 4x + 4 = (2x - 1)(3x - 4)$
 b. $6x^2 + 11x - 4 = (2x - 1)(3x - 4)$ d. $6x^2 - 11x - 4 = (2x - 1)(3x + 4)$

ANS: A PTS: 1

2. The following diagram illustrates that



- a. $6x^2 + 5x - 4 = (2x - 1)(3x + 4)$ c. $6x^2 + 4x + 4 = (2x - 1)(3x - 4)$
 b. $6x^2 + 11x - 4 = (2x - 1)(3x - 4)$ d. $6x^2 - 11x + 4 = (2x - 1)(3x - 4)$

ANS: D PTS: 1

3. The following diagram illustrates that



- a. $6x^2 + 5x + 4 = (-2x - 1)(3x - 4)$ c. $-6x^2 + 5x + 4 = (-2x - 1)(3x - 4)$
 b. $6x^2 - 5x + 4 = (-2x - 1)(3x + 4)$ d. $-6x^2 - 5x + 4 = (-2x - 1)(3x + 4)$

ANS: C PTS: 1

4. The following diagram illustrates that



- a. $6x^2 - 5x - 4 = (-2x - 1)(3x - 4)$ c. $-6x^2 - 5x - 4 = (-2x - 1)(-3x + 4)$
 b. $6x^2 - 5x - 4 = (-2x - 1)(-3x + 4)$ d. $-6x^2 - 5x + 4 = (-2x - 1)(3x + 4)$

ANS: B PTS: 1

5. Expand and simplify $-2x(x - 3)$

- a. $-2x^2 + 6x$ b. $3x^2 - 6x$ c. $6x^2 - 2x$ d. $-6x^2 + 3x$

ANS: A PTS: 1

6. Expand and simplify $3x(x - 2)$

- a. $-2x^2 + 6x$ b. $3x^2 - 6x$ c. $6x^2 - 2x$ d. $-6x^2 + 3x$

ANS: B PTS: 1

7. Expand and simplify $2x(3x - 1)$

- a. $-2x^2 + 6x$ b. $3x^2 - 6x$ c. $6x^2 - 2x$ d. $-6x^2 + 3x$

ANS: C PTS: 1

8. Expand and simplify $-3x(2x - 1)$
 a. $-2x^2 + 6x$ b. $3x^2 - 6x$ c. $6x^2 - 2x$ d. $-6x^2 + 3x$
 ANS: D PTS: 1
9. Expand and simplify $(2x + 1)(x - 3)$
 a. $2x^2 - 5x - 3$ b. $2x^2 + 5x - 3$ c. $2x^2 - 7x + 3$ d. $2x^2 + x - 3$
 ANS: A PTS: 1
10. Expand and simplify $(2x - 1)(x + 3)$
 a. $2x^2 - 5x - 3$ b. $2x^2 + 5x - 3$ c. $2x^2 - 7x + 3$ d. $2x^2 + x - 3$
 ANS: B PTS: 1
11. Expand and simplify $(2x - 1)(x - 3)$
 a. $2x^2 - 5x - 3$ b. $2x^2 + 5x - 3$ c. $2x^2 - 7x + 3$ d. $2x^2 + x - 3$
 ANS: C PTS: 1
12. Expand and simplify $(2x + 3)(x - 1)$
 a. $2x^2 - 5x - 3$ b. $2x^2 + 5x - 3$ c. $2x^2 - 7x + 3$ d. $2x^2 + x - 3$
 ANS: D PTS: 1
13. Factor completely: $9x^2 - 6x$
 a. $3x(3x - 2)$ b. $(3x - 1)^2$ c. $6x(3x - 1)$ d. $(3x - 1)(3x - 2)$
 ANS: A PTS: 1
14. Factor completely: $3x^2 - 3x$
 a. $3(x - 1)^2$ b. $3x(x - 1)$ c. $6x(3x - 1)$ d. $(3x - 1)(3x - 2)$
 ANS: B PTS: 1
15. Factor completely: $2x^2 - x$
 a. $2(x - 1)^2$ b. $2x(x - 1)$ c. $x(2x - 1)$ d. $(2x - 1)(x + 1)$
 ANS: C PTS: 1
16. Factor completely: $-2x^2 + 6x$
 a. $2(x - 3)^2$ b. $x(-2x - 3)$ c. $x(2x - 3)$ d. $-2x(x - 3)$
 ANS: D PTS: 1
17. Factor completely: $2x^2 + 5x + 2$
 a. $(x + 2)(2x + 1)$ b. $(x + 1)(2x + 2)$ c. $2x(x + 1) + 5x$ d. $x(2x + 5) + 2$
 ANS: A PTS: 1

18. Factor completely: $3x^2 + 4x + 1$
 a. $(2x + 1)(x + 1)$ b. $(3x + 1)(x + 1)$ c. $3x(x + 1) + 1$ d. $(2x + 1)(x + 2)$
 ANS: B PTS: 1
19. Factor completely: $3x^2 + 7x + 2$
 a. $(3x + 2)(x + 1)$ b. $(3x + 1)(x + 1)$ c. $(3x + 1)(x + 2)$ d. $x(3x + 7) + 2$
 ANS: C PTS: 1
20. Factor completely: $2x^2 + 7x + 6$
 a. $(2x + 2)(x + 3)$ b. $(2x + 1)(x + 6)$ c. $x(2x + 7) + 6$ d. $(2x + 3)(x + 2)$
 ANS: D PTS: 1
21. Factor completely: $2x^2 + 5x + 3$
 a. $(2x + 3)(x + 1)$ b. $(2x + 1)(x + 3)$ c. $(x + 3)(2x - 1)$ d. $x(2x + 5) + 3$
 ANS: A PTS: 1
22. Factor completely: $2x^2 - 3x - 2$
 a. $(2x - 2)(x + 1)$ b. $(2x + 1)(x - 2)$ c. $(2x - 1)(x - 2)$ d. $(2x - 1)(x - 1)$
 ANS: B PTS: 1
23. Factor completely: $3x^2 + 2x - 1$
 a. $(3x - 1)(x - 1)$ b. $(3x + 1)(x - 1)$ c. $(3x - 1)(x + 1)$ d. $(3x + 1)(x + 1)$
 ANS: C PTS: 1
24. Factor completely: $3x^2 - 5x - 2$
 a. $(3x - 1)(x + 1)$ b. $(3x + 2)(x - 1)$ c. $(3x - 2)(x + 1)$ d. $(3x + 1)(x - 2)$
 ANS: D PTS: 1
25. Factor completely: $2x^2 + x - 6$
 a. $(x - 2)(2x + 3)$ b. $(x + 1)(2x - 6)$ c. $(x - 6)(2x + 1)$ d. $(x + 2)(2x - 3)$
 ANS: D PTS: 1
26. Factor completely: $2x^2 + x - 3$
 a. $(x - 1)(2x + 3)$ b. $(x + 1)(2x - 3)$ c. $(x + 3)(2x - 1)$ d. $(x - 3)(2x + 1)$
 ANS: A PTS: 1
27. Factor completely: $2x^2 - 5x + 2$
 a. $(x - 1)(2x - 2)$ b. $(x - 2)(2x - 1)$ c. $(x + 2)(2x - 1)$ d. $(x + 1)(2x - 2)$
 ANS: B PTS: 1

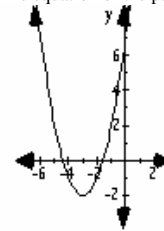
28. Factor completely: $3x^2 - 4x + 1$
 a. $x(3x - 4) + 1$ b. $(x - 1)(3x + 1)$ c. $(x - 1)(3x - 1)$ d. $(x + 1)(3x - 1)$
 ANS: C PTS: 1
29. Factor completely: $3x^2 - 7x + 2$
 a. $(x + 2)(3x + 1)$ b. $(x - 1)(3x - 2)$ c. $(x - 1)(3x + 2)$ d. $(x - 2)(3x - 1)$
 ANS: D PTS: 1
30. Factor completely: $2x^2 - 7x + 6$
 a. $(x - 2)(2x - 3)$ b. $(x - 6)(2x - 1)$ c. $(x - 3)(2x - 2)$ d. $(x - 1)(2x - 6)$
 ANS: A PTS: 1
31. Factor completely: $2x^2 - 9x + 9$
 a. $(x + 3)(2x - 3)$ b. $(x - 3)(2x - 3)$ c. $(x - 9)(2x - 1)$ d. $(x - 1)(2x - 9)$
 ANS: B PTS: 1
32. Factor completely: $9x^2 - 16$
 a. $(3x - 4)^2$ b. $(9x - 16)(x + 1)$ c. $(3x - 4)(3x + 4)$ d. $(9x - 1)(x + 16)$
 ANS: C PTS: 1
33. Factor completely: $x^2 - 16$
 a. $(x - 4)^2$ b. $(x - 16)(x + 1)$ c. $(x + 16)(x - 1)$ d. $(x - 4)(x + 4)$
 ANS: D PTS: 1
34. Factor completely: $4x^2 - 9$
 a. $(2x - 3)(2x + 3)$ b. $(2x - 3)^2$ c. $(4x - 9)(x + 1)$ d. $(4x + 9)(x - 1)$
 ANS: A PTS: 1
35. Factor completely: $4x^2 - 25$
 a. $(2x - 5)^2$ b. $(2x - 5)(2x + 5)$ c. $(4x - 5)(x + 5)$ d. $(4x + 5)(x - 5)$
 ANS: B PTS: 1
36. Factor completely: $4x^2 - 1$
 a. $(4x - 1)(x + 1)$ b. $(2x - 1)^2$ c. $(2x - 1)(2x + 1)$ d. $(4x + 1)(x - 1)$
 ANS: C PTS: 1
37. Factor completely: $9x^2 - 1$
 a. $(9x - 1)(x + 1)$ b. $(3x - 1)^2$ c. $(x - 1)(9x + 1)$ d. $(3x + 1)(3x - 1)$
 ANS: D PTS: 1

38. Factor completely: $9x^2 + 6x + 1$
 a. $(3x + 1)^2$ b. $(x + 1)(9x + 1)$ c. $3x(3x + 2) + 1$ d. $(3x + 1)(3x - 1)$
 ANS: A PTS: 1
39. Factor completely: $9x^2 - 24x + 16$
 a. $(3x + 4)(3x - 4)$ b. $(3x - 4)^2$ c. $(9x + 4)(x - 4)$ d. $(9x - 16)(x + 1)$
 ANS: B PTS: 1
40. Factor completely: $4x^2 - 4x + 1$
 a. $(4x + 1)(x - 1)$ b. $(4x - 1)(x + 1)$ c. $(2x - 1)^2$ d. $(2x - 1)(2x + 1)$
 ANS: C PTS: 1
41. Factor completely: $4x^2 - 20x + 25$
 a. $(2x + 5)(2x - 5)$ b. $(4x - 5)(x - 5)$ c. $(4x - 25)(x - 1)$ d. $(2x - 5)^2$
 ANS: D PTS: 1
42. Factor completely: $4x^2 - 12x + 9$
 a. $(2x - 3)^2$ b. $(4x - 3)(x - 3)$ c. $(4x - 9)(x - 1)$ d. $(2x - 9)(2x - 1)$
 ANS: A PTS: 1
43. Factor completely: $x^2 - 8x + 16$
 a. $(x - 2)(x - 8)$ b. $(x - 4)^2$ c. $(x - 16)(x - 1)$ d. $(x - 4)(x + 4)$
 ANS: B PTS: 1
44. Solve for x: $(2x + 1)(x - 4) = 0$
 a. $x = -\frac{1}{2}$ or $x = 4$ b. $x = \frac{1}{2}$ or $x = 4$ c. $x = -\frac{1}{2}$ or $x = -4$ d. $x = \frac{1}{2}$ or $x = -4$
 ANS: A PTS: 1
45. Solve for x: $(2x - 1)(x - 4) = 0$
 a. $x = -\frac{1}{2}$ or $x = 4$ b. $x = \frac{1}{2}$ or $x = 4$ c. $x = -\frac{1}{2}$ or $x = -4$ d. $x = \frac{1}{2}$ or $x = -4$
 ANS: B PTS: 1
46. Solve for x: $(2x - 1)(x + 4) = 0$
 a. $x = -\frac{1}{2}$ or $x = 4$ b. $x = \frac{1}{2}$ or $x = 4$ c. $x = -\frac{1}{2}$ or $x = -4$ d. $x = \frac{1}{2}$ or $x = -4$
 ANS: D PTS: 1
47. Solve for x: $(2x + 1)(x + 4) = 0$
 a. $x = -\frac{1}{2}$ or $x = 4$ b. $x = \frac{1}{2}$ or $x = 4$ c. $x = -\frac{1}{2}$ or $x = -4$ d. $x = \frac{1}{2}$ or $x = -4$
 ANS: C PTS: 1

2D 11 Transformations & Quadratics

MULTIPLE CHOICE

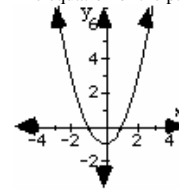
1. The equation of the parabola shown is



- a. $y = (x + 3)^2 - 2$ b. $y = (x - 3)^2 - 2$ c. $y = (x + 3)^2 + 2$ d. $y = (x - 3)^2 + 2$

ANS: A PTS: 1

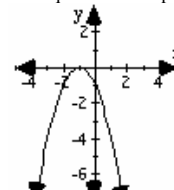
2. The equation of the parabola shown is



- a. $y = (x - 1)^2$ b. $y = x^2 - 1$ c. $y = (x + 1)^2$ d. $y = x^2 + 1$

ANS: B PTS: 1

3. The equation of the parabola shown is



- a. $y = -(x - 1)^2$ b. $y = -x^2 - 1$ c. $y = -(x + 1)^2$ d. $y = -x^2 + 1$

ANS: C PTS: 1

48. Write an equation that has roots -1 and 2.

- a. $(x + 1)(x - 2) = 0$ c. $(x - 1)(x + 2) = 0$
b. $y = (x + 1)(x - 2)$ d. $y = (x - 1)(x + 2)$

ANS: A PTS: 1

49. Write an equation that has roots -2 and 1.

- a. $(x + 1)(x - 2) = 0$ c. $(x - 1)(x + 2) = 0$
b. $y = x^2 - x - 2$ d. $y = x^2 + x - 2$

ANS: C PTS: 1

50. Write the equation of a parabola that has zeros at -2 and 1.

- a. $(x + 1)(x - 2) = 0$ c. $(x - 1)(x + 2) = 0$
b. $y = (x + 1)(x - 2)$ d. $y = (x - 1)(x + 2)$

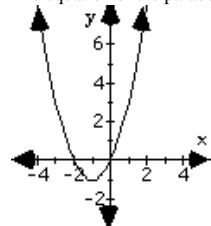
ANS: D PTS: 1

51. Write the equation of a parabola that has zeros at -1 and 2.

- a. $(x + 1)(x - 2) = 0$ c. $(x - 1)(x + 2) = 0$
b. $y = (x + 1)(x - 2)$ d. $y = (x - 1)(x + 2)$

ANS: B PTS: 1

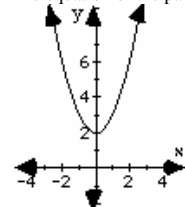
4. The equation of the parabola shown is



- a. $y = (x-1)^2 - 1$ b. $y = (x-1)^2 + 1$ c. $y = (x+1)^2 + 1$ d. $y = (x+1)^2 - 1$

ANS: D PTS: 1

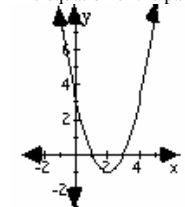
5. The equation of the parabola shown is



- a. $y = x^2 + 2$ b. $y = (x+2)^2$ c. $y = (x-2)^2$ d. $y = x^2 - 2$

ANS: A PTS: 1

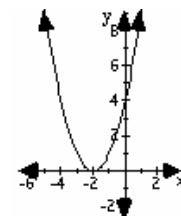
6. The equation of the parabola shown is



- a. $y = (x+2)^2 - 1$ b. $y = (x-2)^2 - 1$ c. $y = (x-2)^2 + 1$ d. $y = (x+2)^2 + 1$

ANS: B PTS: 1

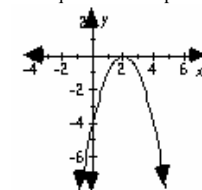
7. The equation of the parabola shown is



- a. $y = (x-2)^2$ b. $y = x^2 - 2$ c. $y = (x+2)^2$ d. $y = x^2 + 2$

ANS: C PTS: 1

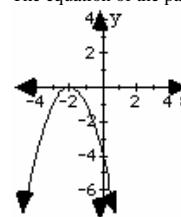
8. The equation of the parabola shown is



- a. $y = (-x+2)^2$ b. $y = -x^2 + 2$ c. $y = -(x+2)^2$ d. $y = -(x-2)^2$

ANS: D PTS: 1

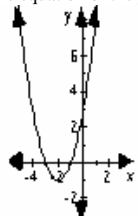
9. The equation of the parabola shown is



- a. $y = (-x+2)^2$ b. $y = -(x^2 - 2)$ c. $y = -(x+2)^2$ d. $y = -(x-2)^2$

ANS: C PTS: 1

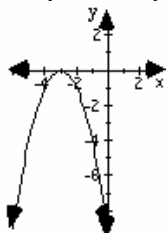
10. The equation of the parabola shown is



- a. $y = (x-2)^2 - 1$ b. $y = (x+2)^2 - 1$ c. $y = (x+2)^2 + 1$ d. $y = (x-2)^2 + 1$

ANS: B PTS: 1

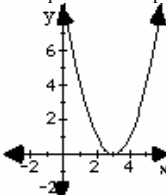
11. The equation of the parabola shown is



- a. $y = (-x+3)^2$ b. $y = (-x-3)^2$ c. $y = -(x-3)^2$ d. $y = -(x+3)^2$

ANS: D PTS: 1

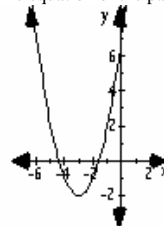
12. The equation of the parabola shown is



- a. $y = (x-3)^2$ b. $y = (x+3)^2$ c. $y = x^2 + 3$ d. $y = x^2 - 3$

ANS: A PTS: 1

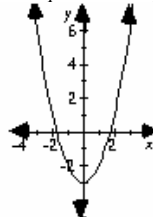
13. The equation of the parabola shown is



- a. $y = (x-3)^2 - 2$ b. $y = (x+3)^2 - 2$ c. $y = (x+3)^2 + 2$ d. $y = (x-3)^2 + 2$

ANS: B PTS: 1

14. The equation of the parabola shown is



- a. $y = x^2 + 3$ b. $y = (x+3)^2$ c. $y = x^2 - 3$ d. $y = (x-3)^2$

ANS: C PTS: 1

15. Which equation defines the image of $y = x^2$ under a translation 3 units right?

- a. $y = (x-3)^2$ b. $y = (x+3)^2$ c. $y = x^2 - 3$ d. $y = x^2 + 3$

ANS: A PTS: 1

16. Which equation defines the image of $y = x^2$ under a translation 3 units down?

- a. $y = (x-3)^2$ b. $y = (x+3)^2$ c. $y = x^2 - 3$ d. $y = x^2 + 3$

ANS: C PTS: 1

17. Which equation defines the image of $y = x^2$ under a translation 3 units up?

- a. $y = (x-3)^2$ b. $y = (x+3)^2$ c. $y = x^2 - 3$ d. $y = x^2 + 3$

ANS: D PTS: 1

18. Which equation defines the image of $y = x^2$ under a translation 3 units left?

- a. $y = (x-3)^2$ b. $y = (x+3)^2$ c. $y = x^2 - 3$ d. $y = x^2 + 3$

ANS: B PTS: 1

19. Which equation defines the image of $y = x^2$ under a reflection in the x-axis and a vertical stretch of factor 2.

a. $y = 2x^2$ b. $y = (-2x)^2$ c. $y = -2x^2$ d. $y = -x^2 + 2$

ANS: C PTS: 1

20. Which equation defines the image of $y = x^2$ under a reflection in the y-axis and a vertical stretch of factor 2.

a. $y = 2x^2$ b. $y = (-2x)^2$ c. $y = -2x^2$ d. $y = -x^2 + 2$

ANS: A PTS: 1

21. Which equation defines the image of $y = x^2$ under a reflection in the x-axis and a vertical stretch of factor $\frac{1}{2}$.

a. $y = 2x^2$ b. $y = (-\frac{1}{2}x)^2$ c. $y = -2x^2$ d. $y = -\frac{1}{2}x^2$

ANS: D PTS: 1

2D 12 Quadratic Relations 2

MULTIPLE CHOICE

1. A relation is defined by $y = 3(x - 2)^2 + 1$. Which of the following points belong to this relation?
A(3,4) B(-3,4) C(-2,1)

a. A b. A & B c. C d. none

ANS: A PTS: 1

2. A relation is defined by $y = 2(x + 1)^2 - 3$. Which of the following points belong to this relation?
A(1,-3) B(-1,-3) C(-2,-1)

a. A b. B c. C d. B & C

ANS: D PTS: 1

3. A relation is defined by $y = 3(x + 1)^2 - 2$. Which of the following points belong to this relation?
A(0,-1) B(-1,2) C(-2,1)

a. A b. B c. C d. B & C

ANS: C PTS: 1

4. A relation is defined by $y = -(x - 2)^2 + 1$. Which of the following points belong to this relation?
A(3,2) B(0,-3) C(1,2)

a. A b. B c. C d. B & C

ANS: B PTS: 1

5. A relation is defined by $y = 3(x - 2)^2 + 1$. This relation has a minimum or maximum value of
a. minimum 1 b. maximum 3 c. minimum -2 d. maximum 2

ANS: A PTS: 1

6. A relation is defined by $y = -(x - 2)^2 + 3$. This relation has a minimum or maximum value of
a. minimum 1 b. maximum 3 c. minimum -2 d. maximum 2

ANS: B PTS: 1

7. A relation is defined by $y = (x - 3)^2 - 2$. This relation has a minimum or maximum value of
a. minimum 1 b. maximum 3 c. minimum -2 d. maximum 2

ANS: C PTS: 1

8. A relation is defined by $y = -3(x + 1)^2 + 2$. This relation has a minimum or maximum value of
a. minimum 1 b. maximum 3 c. minimum -2 d. maximum 2

ANS: D PTS: 1

9. A relation is defined by $y = -3x(x + 2) + 4$. Two points on the parabola are:

a. (0,4) and (-2,4) b. (3,4) and (-2,4) c. (0,4) and (2,4) d. (3,4) and (2,4)

ANS: A PTS: 1

10. A relation is defined by $y = -2x(x - 3) + 4$. Two points on the parabola are:
a. (0,4) and (2,4) b. (3,4) and (0,4) c. (-3,4) and (0,4) d. (3,4) and (2,4)

ANS: B PTS: 1

11. A relation is defined by $y = -(x + 2)(x - 3) + 4$. Two points on the parabola are:
a. (2,4) and (3,4) b. (-3,4) and (-2,4) c. (3,4) and (-2,4) d. (-3,4) and (2,4)

ANS: C PTS: 1

12. A relation is defined by $y = -4(x - 2)(x + 3) + 4$. Two points on the parabola are:
a. (2,4) and (3,4) b. (-3,4) and (-2,4) c. (3,4) and (-2,4) d. (-3,4) and (2,4)

ANS: D PTS: 1

13. A relation is defined by $y = -(x - 2)(x + 6) + 4$. Its axis of symmetry has equation...
a. $x = -2$ b. $x = -4$ c. $x = 4$ d. $x = 2$

ANS: A PTS: 1

14. A relation is defined by $y = -2x(x + 6) + 4$. Its axis of symmetry has equation...
a. $x = -6$ b. $x = -3$ c. $x = 3$ d. $x = 6$

ANS: B PTS: 1

15. A relation is defined by $y = -4x(x - 6) + 4$. Its axis of symmetry has equation...
a. $x = -6$ b. $x = -3$ c. $x = 3$ d. $x = 6$

ANS: C PTS: 1

16. A relation is defined by $y = -x(x - 4) + 6$. Its axis of symmetry has equation...
a. $x = -6$ b. $x = -3$ c. $x = 3$ d. $x = 2$

ANS: D PTS: 1

17. If $(x - 1)^2 - 9 = 0$ then
a. $x = 4$ or $x = -2$ b. $x = \pm 4$ c. $x = \pm 2$ d. $x = 2$ or $x = -4$

ANS: A PTS: 1

18. If $(x^2 - 7) - 9 = 0$ then
a. $x = 4$ or $x = -2$ b. $x = \pm 4$ c. $x = \pm 2$ d. $x = 2$ or $x = -4$

ANS: B PTS: 1

19. If $(x^2 + 5) - 9 = 0$ then
a. $x = 4$ or $x = -2$ b. $x = \pm 4$ c. $x = \pm 2$ d. $x = 2$ or $x = -4$

ANS: C PTS: 1

20. If $(x + 1)^2 - 9 = 0$ then
a. $x = 4$ or $x = -2$ b. $x = \pm 4$ c. $x = \pm 2$ d. $x = 2$ or $x = -4$

ANS: D PTS: 1

21. If $x^2 + x - 6 = 0$ then
a. $x = -3$ or $x = 2$ b. $x = 3$ or $x = -2$ c. $x = 6$ or $x = -1$ d. $x = -6$ or $x = 1$

ANS: A PTS: 1

22. If $x^2 - x - 6 = 0$ then
a. $x = -3$ or $x = 2$ b. $x = 3$ or $x = -2$ c. $x = 6$ or $x = -1$ d. $x = -6$ or $x = 1$

ANS: B PTS: 1

23. If $x^2 - 5x - 6 = 0$ then
a. $x = -3$ or $x = 2$ b. $x = 3$ or $x = -2$ c. $x = 6$ or $x = -1$ d. $x = -6$ or $x = 1$

ANS: C PTS: 1

24. If $x^2 + 5x - 6 = 0$ then
a. $x = -3$ or $x = 2$ b. $x = 3$ or $x = -2$ c. $x = 6$ or $x = -1$ d. $x = -6$ or $x = 1$

ANS: D PTS: 1

25. Complete the square: $x^2 - 6x$ is equal to
a. $(x - 3)^2 - 9$ b. $(x + 3)^2 - 9$ c. $x(x - 6)$ d. $(x - 3)^2 + 9$

ANS: A PTS: 1

26. Complete the square: $x^2 - 8x$ is equal to
a. $(x - 4)^2 + 8$ b. $(x - 4)^2 - 16$ c. $(x - 8)^2 - 64$ d. $x(x - 4) - 4x$

ANS: B PTS: 1

27. Complete the square: $x^2 - 4x$ is equal to
a. $(x - 4)^2 - 4$ b. $(x - 4)^2 - 16$ c. $(x - 2)^2 - 4$ d. $(x + 1)(x - 4)$

ANS: C PTS: 1

28. Complete the square: $x^2 - 10x$ is equal to
a. $(x - 10)^2 - 100$ c. $(x - 5)(x + 5) + 25$
b. $(x - 10)^2 - 25$ d. $(x - 5)^2 - 25$

ANS: D PTS: 1

29. Complete the square: $x^2 + 2x$ is equal to
a. $(x - 1)^2 - 1$ b. $(x + 1)^2 + 1$ c. $(x + 1)^2 - 1$ d. $(x + 2)^2 - 4$

ANS: C PTS: 1

30. The equation $x^2 - 5x = 0$ has discriminant
 a. 25 b. 1 c. 29 d. 21
 ANS: A PTS: 1
31. The equation $x^2 - 5x = 1$ has discriminant
 a. 25 b. 1 c. 29 d. 21
 ANS: C PTS: 1
32. The equation $5x^2 - x = 1$ has discriminant
 a. 25 b. 1 c. 29 d. 21
 ANS: D PTS: 1
33. The equation $5x^2 - x = 0$ has discriminant
 a. 25 b. 1 c. 29 d. 21
 ANS: B PTS: 1
34. The equation $x^2 + 6x + 5 = 0$ has
 a. no real roots b. one real root c. two distinct real roots
 ANS: C PTS: 1
35. The equation $x^2 + 6x + 9 = 0$ has
 a. no real roots b. one real root c. two distinct real roots
 ANS: B PTS: 1
36. The equation $x^2 - 6x + 8 = 0$ has
 a. no real roots b. one real root c. two distinct real roots
 ANS: C PTS: 1
37. The equation $2x^2 - 6x - 7 = 0$ has
 a. no real roots b. one real root c. two distinct real roots
 ANS: C PTS: 1
38. The equation $3x^2 - 8x + 2 = 0$ has
 a. no real roots b. one real root c. two distinct real roots
 ANS: C PTS: 1
39. The equation $4x^2 - 12x + 9 = 0$ has
 a. no real roots b. one real root c. two distinct real roots
 ANS: B PTS: 1
40. The equation $4x^2 - 4x + 1 = 0$ has
 a. no real roots b. one real root c. two distinct real roots
 ANS: B PTS: 1

41. The equation $x^2 + 12x + 36 = 0$ has
 a. no real roots b. one real root c. two distinct real roots
 ANS: B PTS: 1
42. The equation $x^2 + 6x + 10 = 0$ has
 a. no real roots b. one real root c. two distinct real roots
 ANS: A PTS: 1
43. The equation $2x^2 - 4x + 5 = 0$ has
 a. no real roots b. one real root c. two distinct real roots
 ANS: A PTS: 1
44. The equation $x^2 - x + 5 = 0$ has
 a. no real roots b. one real root c. two distinct real roots
 ANS: A PTS: 1
45. The equation $4x^2 + 6x + 9 = 0$ has
 a. no real roots b. one real root c. two distinct real roots
 ANS: A PTS: 1
46. If $ax^2 + bx + c = 0$ then
 a. $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ c. $x = -b \pm \frac{\sqrt{b^2 - 4ac}}{2a}$
 b. $x = \frac{-b \pm \sqrt{b^2 - 2a}}{4ac}$ d. $x = -b \pm \frac{\sqrt{b^2 - 2a}}{4ac}$
 ANS: A PTS: 1
47. If $ax^2 + bx + c = 0$ then
 a. $x = \frac{-b \pm \sqrt{b^2 - 2a}}{4ac}$ c. $x = -b \pm \frac{\sqrt{b^2 - 4ac}}{2a}$
 b. $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ d. $x = -b \pm \frac{\sqrt{b^2 - 2a}}{4ac}$
 ANS: B PTS: 1
48. If $ax^2 + bx + c = 0$ then
 a. $x = \frac{-b \pm \sqrt{b^2 - 2a}}{4ac}$ c. $x = -b \pm \frac{\sqrt{b^2 - 4ac}}{2a}$
 b. $x = -b \pm \frac{\sqrt{b^2 - 4ac}}{2a}$ d. $x = -b \pm \frac{\sqrt{b^2 - 2a}}{4ac}$
 ANS: C PTS: 1

49. If $ax^2 + bx + c = 0$ then

a. $x = \frac{-b \pm \sqrt{b^2 - 2a}}{4ac}$

b. $x = -b \pm \frac{\sqrt{b^2 - 4ac}}{2a}$

ANS: D PTS: 1

c. $x = -b \pm \frac{\sqrt{b^2 - 2a}}{4ac}$

d. $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

2D 13 Proportional Thinking and Trigonometry

MULTIPLE CHOICE

1. If $x:30 = 28:35$ then $x =$
a. 24 b. 23 c. 21 d. 25

ANS: A PTS: 1

2. If $15:x = 10:12$ then $x =$
a. 24 b. 18 c. 21 d. 17

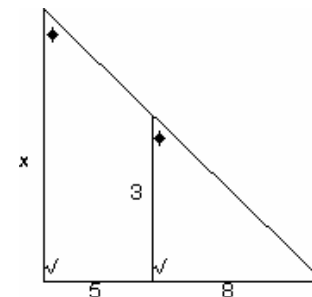
ANS: B PTS: 1

3. If $18:20 = x:30$ then $x =$
a. 26 b. 24 c. 27 d. 28

ANS: C PTS: 1

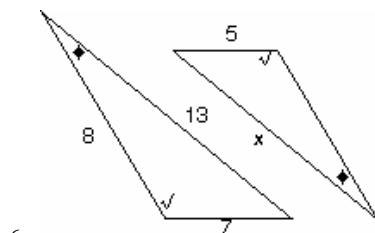
4. If $40:24 = 15:x$ then $x =$
a. 10 b. 14 c. 12 d. 9

ANS: D PTS: 1



5. a. $\frac{x}{3} = \frac{13}{8}$ b. $\frac{x}{5} = \frac{3}{8}$ c. $\frac{x}{8} = \frac{3}{5}$ d. $\frac{x}{13} = \frac{8}{3}$

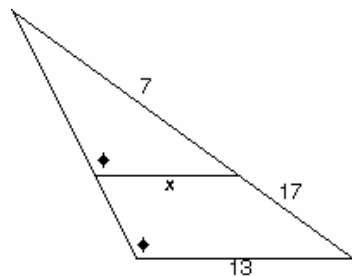
ANS: A PTS: 1



6. a. $\frac{x}{13} = \frac{5}{8}$ b. $\frac{x}{5} = \frac{13}{7}$ c. $\frac{x}{13} = \frac{7}{5}$ d. $\frac{x}{7} = \frac{5}{13}$

ANS: B

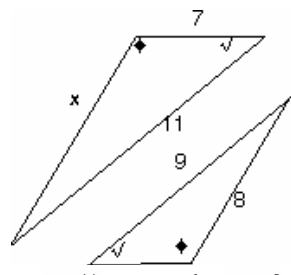
PTS: 1



7. a. $\frac{x}{13} = \frac{7}{17}$ b. $\frac{x}{7} = \frac{13}{17}$ c. $\frac{x}{13} = \frac{7}{24}$ d. $\frac{x}{17} = \frac{13}{7}$

ANS: C

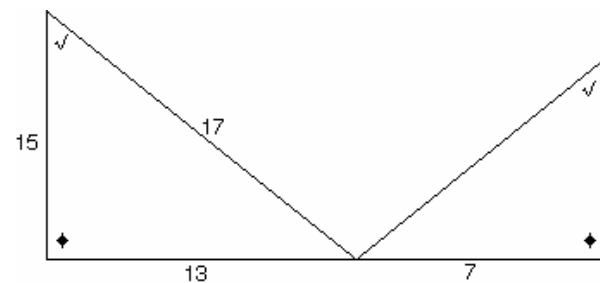
PTS: 1



8. a. $\frac{x}{9} = \frac{11}{8}$ b. $\frac{x}{11} = \frac{9}{8}$ c. $\frac{x}{9} = \frac{8}{11}$ d. $\frac{x}{8} = \frac{11}{9}$

ANS: D

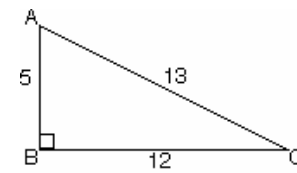
PTS: 1



9. a. $\frac{x}{15} = \frac{7}{17}$ b. $\frac{x}{13} = \frac{7}{17}$ c. $\frac{x}{15} = \frac{7}{13}$ d. $\frac{x}{7} = \frac{13}{15}$

ANS: C

PTS: 1

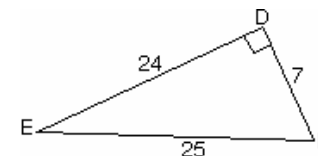


10. In the diagram, $\sin A =$

- a. $\frac{12}{13}$ b. $\frac{5}{13}$ c. $\frac{12}{5}$ d. $\frac{13}{12}$

ANS: A

PTS: 1

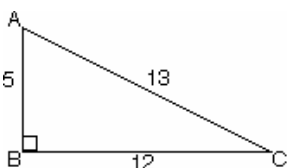


11. In the diagram, $\sin E =$

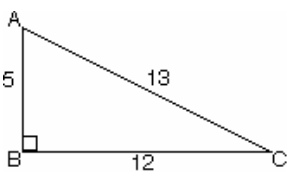
- a. $\frac{24}{7}$ b. $\frac{7}{25}$ c. $\frac{24}{25}$ d. $\frac{7}{24}$

ANS: B

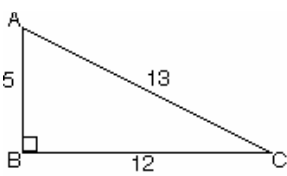
PTS: 1

12.  In the diagram, $\cos A =$
- a. $\frac{12}{13}$ b. $\frac{5}{13}$ c. $\frac{12}{5}$ d. $\frac{13}{12}$

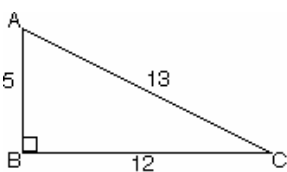
ANS: B PTS: 1

13.  In the diagram, $\tan A =$
- a. $\frac{12}{13}$ b. $\frac{5}{13}$ c. $\frac{12}{5}$ d. $\frac{13}{12}$

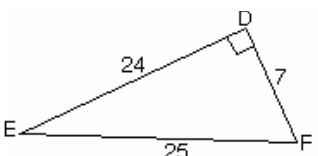
ANS: C PTS: 1


14.  In the diagram, $\sin C =$
- a. $\frac{12}{13}$ b. $\frac{5}{13}$ c. $\frac{12}{5}$ d. $\frac{13}{12}$

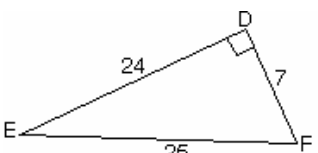
ANS: B PTS: 1

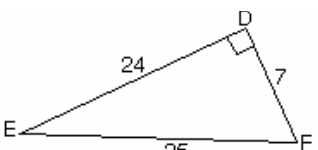
15.  In the diagram, $\tan C =$
- a. $\frac{12}{13}$ b. $\frac{5}{13}$ c. $\frac{12}{5}$ d. $\frac{5}{12}$

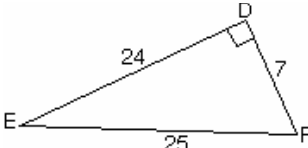
ANS: D PTS: 1

16.  In the diagram, $\cos E =$
- a. $\frac{7}{24}$ b. $\frac{7}{25}$ c. $\frac{24}{25}$ d. $\frac{24}{7}$
- ANS: C PTS: 1

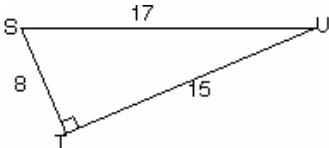
17.  In the diagram, $\tan E =$
- a. $\frac{7}{24}$ b. $\frac{7}{25}$ c. $\frac{24}{25}$ d. $\frac{24}{7}$
- ANS: A PTS: 1

18.  In the diagram, $\tan F =$
- a. $\frac{7}{24}$ b. $\frac{7}{25}$ c. $\frac{24}{25}$ d. $\frac{24}{7}$
- ANS: D PTS: 1

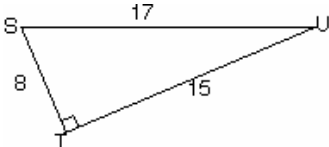
19.  In the diagram, $\sin F =$
- a. $\frac{7}{24}$ b. $\frac{7}{25}$ c. $\frac{24}{25}$ d. $\frac{24}{7}$
- ANS: C PTS: 1

20.  In the diagram, $\cos F =$
- a. $\frac{7}{24}$ b. $\frac{7}{25}$ c. $\frac{24}{25}$ d. $\frac{24}{7}$

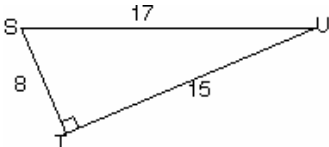
ANS: B PTS: 1

21.  In the diagram, $\cos S =$
- a. $\frac{8}{17}$ b. $\frac{8}{15}$ c. $\frac{15}{17}$ d. $\frac{15}{8}$

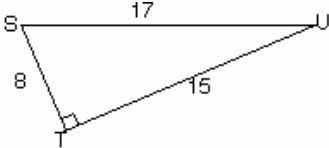
ANS: A PTS: 1

22.  In the diagram, $\cos U =$
- a. $\frac{8}{17}$ b. $\frac{8}{15}$ c. $\frac{15}{17}$ d. $\frac{15}{8}$

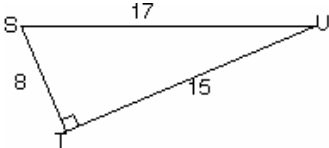
ANS: C PTS: 1

23.  In the diagram, $\sin S =$
- a. $\frac{8}{17}$ b. $\frac{8}{15}$ c. $\frac{15}{17}$ d. $\frac{15}{8}$

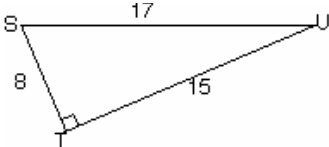
ANS: C PTS: 1

24.  In the diagram, $\sin U =$
- a. $\frac{8}{17}$ b. $\frac{8}{15}$ c. $\frac{15}{17}$ d. $\frac{15}{8}$

ANS: A PTS: 1

25.  In the diagram, $\tan U =$
- a. $\frac{8}{17}$ b. $\frac{8}{15}$ c. $\frac{15}{17}$ d. $\frac{15}{8}$

ANS: B PTS: 1

26.  In the diagram, $\tan S =$
- a. $\frac{8}{17}$ b. $\frac{8}{15}$ c. $\frac{15}{17}$ d. $\frac{15}{8}$

ANS: D PTS: 1

27. If θ is an angle in a right triangle, and $\sin \theta = 0.621$, then θ is approximately
- a. 38.4° b. 0.0108° c. 51.6° d. 31.8°

ANS: A PTS: 1

28. If θ is an angle in a right triangle, and $\cos \theta = 0.621$, then θ is approximately
- a. 38.4° b. 0.0108° c. 51.6° d. 31.8°

ANS: C PTS: 1

29. If θ is an angle in a right triangle, and $\tan \theta = 0.621$, then θ is approximately
- a. 38.4° b. 0.0108° c. 51.6° d. 31.8°

ANS: D PTS: 1

30. If θ is an angle in a right triangle, and $\sin \theta = 0.346$, then θ is approximately
 a. 0.353° b. 20.2° c. 69.8° d. 0.006°

ANS: B PTS: 1

31. If θ is an angle in a right triangle, and $\cos \theta = 0.346$, then θ is approximately
 a. 0.353° b. 20.2° c. 69.8° d. 0.006°

ANS: C PTS: 1

32. If θ is an angle in a right triangle, and $\tan \theta = 0.346$, then θ is approximately
 a. 0.353° b. 20.2° c. 69.8° d. 19.09°

ANS: D PTS: 1

33. $\cos 28^\circ$ is approximately
 a. 0.8829 b. -0.9626 c. 0.5317 d. 0.4695

ANS: A PTS: 1

34. $\sin 28^\circ$ is approximately
 a. 0.8829 b. -0.9626 c. 0.5317 d. 0.4695

ANS: D PTS: 1

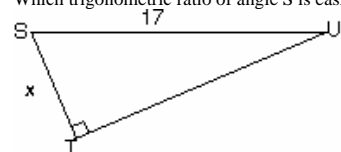
35. $\tan 28^\circ$ is approximately
 a. 0.8829 b. -0.9626 c. 0.5317 d. 0.4695

ANS: C PTS: 1

36. $\cos 62^\circ$ is approximately
 a. 0.6735 b. 0.4695 c. 0.5317 d. 0.8829

ANS: B PTS: 1

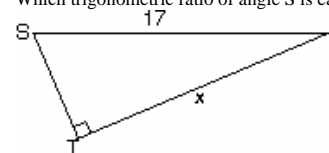
37. Which trigonometric ratio of angle S is easiest to determine x in the following diagram?



- a. $\sin S$ b. $\cos S$ c. $\tan S$

ANS: B PTS: 1

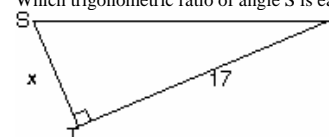
38. Which trigonometric ratio of angle S is easiest to determine x in the following diagram?



- a. $\sin S$ b. $\cos S$ c. $\tan S$

ANS: A PTS: 1

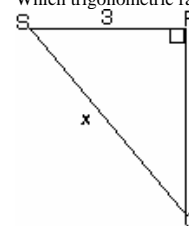
39. Which trigonometric ratio of angle S is easiest to determine x in the following diagram?



- a. $\sin S$ b. $\cos S$ c. $\tan S$

ANS: C PTS: 1

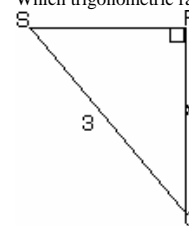
40. Which trigonometric ratio of angle S is easiest to determine x in the following diagram?



- a. $\tan S$ b. $\sin S$ c. $\cos S$

ANS: C PTS: 1

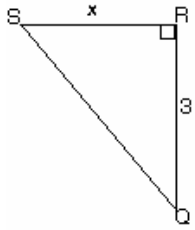
41. Which trigonometric ratio of angle S is easiest to determine x in the following diagram?



- a. $\tan S$ b. $\sin S$ c. $\cos S$

ANS: B PTS: 1

42. Which trigonometric ratio of angle S is easiest to determine x in the following diagram?



a. $\tan S$

b. $\sin S$

c. $\cos S$

ANS: A

PTS: 1